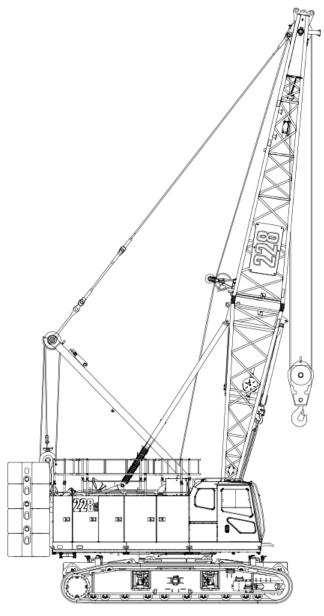


## <u>iecnnicai Data</u>

Specifications & Capacities





CAUTION: This material is supplied for reference use only. Operator must refer to in—cab Crane Rating Manual and Operator's Manual to determine allowable crane lifting capacities and assembly and operating procedures.

Link-Belt Cranes 228 HSL

220 HGI



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## RELIABLE CRANE SERVICE

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# **Upper Structure**

#### Frame

All welded steel frame with precision machined surfaces for mating parts.

#### **Turntable Bearing**

- Inner race with internal swing gear is bolted to lower frame.
- · Outer race is bolted to upper frame.

### **Engine**

#### **Engine**

Full pressure lubrication, oil filter, air cleaner, hour meter, throttle, and electric control shutdown.

| Cummins QSE                   | 36.7 Tier 4 Final                   |  |
|-------------------------------|-------------------------------------|--|
| Number of cylinders           | 6                                   |  |
| Bore and stroke               | 4.20 in x 4.88 in<br>(107 x 124mm)  |  |
| Piston displacement           | 408 in <sup>3</sup> (6.8L)          |  |
| Engine rpm at full load speed | 2,000 rpm                           |  |
| Hi-idle rpm                   | 2,000 rpm                           |  |
| Gross engine hp               | 270 hp (210kw)                      |  |
| Peak torque                   | 730 ft lb (990joule) @<br>1,500 rpm |  |
| Electrical system             | 24 volt                             |  |
| Fuel tank capacity            | 122 gal (460L)                      |  |
| Batteries                     | 2-12 volt                           |  |
| Approximate fuel consumption  | gal/hr <i>(L/hr)</i>                |  |
| 100% hp                       | 12.62 (47.77)                       |  |
| 75% hp                        | 10.57 (40.01)                       |  |
| 50% hp                        | 7.57 (28.66)                        |  |
| 25% hp                        | 4.16 (15.75)                        |  |

#### Fuel Tank

Equipped with fuel sight level gauges, flame arrester, and self-closing cap with door lock.

### **Hydraulic System**

#### **Hydraulic Pumps**

The pump arrangement is designed to provide hydraulically powered functions allowing positive, precise control with independent or simultaneous operation of all crane functions.

- Two variable displacement pumps operating at 4,551 psi (320kg/cm²) and 70.3 gal/min (266L/min) powers load hoist drums, boom hoist drum, optional third drum, optional fourth drum, and travel.
- One variable displacement pump operating at 4,623 psi (325kg/cm²) and 40.2 gal/min (152L/min) powers the swing motors.
- One fixed displacement gear type pump operating at 2,985 psi (210kg/cm²) and 15.1 gal/min (57L/min) powers the lower jacks, counterweight removal, self assembly, side frame extend/retract, and hoist brake cooling.
- One fixed displacement gear type pump operating at 1,422 psi (100kg/cm²) and 10.3 gal/min (39L/min) powers the pilot control system, clutches, brakes, and pump controls.
- One fixed displacement gear type pump operating at 1,420 psi (100kg/cm²) and 7.9 gal/min (30L/min) powers the optional tagline winch.

#### Hydraulic Reservoir

85 gal (320L), equipped with sight level gauge. Diffusers built in for deaeriation.

#### Filtration

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Ten micron, full flow, line filter in the control circuit. All oil is filtered prior to entering the reservoir.

#### Counterbalance Valves

All hoist motors are equipped with counterbalance valves to provide positive load lowering and prevent accidental load drop if the hydraulic pressure is suddenly lost.

### **Load Hoist Drums**

Each drum contains an axial piston, variable speed hydraulic motor with individual automatic winch motor brakes. Power flow is directed through a patented, semi—outboard mounted, "wet" style multi—disc brake. The brake is mounted on the "output" side of the planetary, which greatly reduces drag associated with most "wet" style brakes in free—fall mode.

- Power up/down & free—fall operation modes
- Automatic brake mode (spring applied, hydraulically released, wet type brake)
- · Drum lagging grooved for wire rope
- Drum pawl controlled automatically
- Electronic drum rotation indicators
- Mounted on anti-friction bearings
- 21.81 in (0.55m) root diameter
- 37.81 in (0.96m) flange diameter
- 25.25 in (0.64m) width

The free—fall operation mode is designed to prevent load lowering even if the free—fall switch is accidentally activated.

The automatic brake mode meets all OSHA requirements for personnel handling.

#### Optional Front—Mounted Third Hoist Drum

The hydraulic winch is pinned to the front of the upper frame and is used in conjunction with a fleeting sheave and 3—sheave idler assembly to run the wire rope over the boom top section.

- Power up/down for luffer applications where a second load line is needed
- Controlled free spooling capability for pile driving applications or auxiliary hoist line for luffer applications.
- 12.75 in (0.32m) root diameter
- 22.75 in (0.58m) flange diameter
- 17 in (0.43m) width
- Mounted on anti—friction bearings
- · Drum lagging grooved for wire rope



## Optional Rear—Mounted Fourth Hoist Drum

Drum contains an axial piston, variable speed hydraulic motor with individual automatic winch motor brakes. Power flow is directed through a patented, semi—outboard mounted, "wet" style multi—disc brake.

- Power up/down & free—fall operation modes
- Automatic brake mode (spring applied, hydraulically released, wet type brake)
- Drum lagging grooved for wire rope
- Drum pawl controlled automatically
- · Electronic drum rotation indicators
- Mounted on anti-friction bearings
- 21.50 in (0.54m) root diameter
- 40.94 in (1.04m) flange diameter
- 24.63 in (0.62m) width
- · Pins to rear of upper frame
- Plumbing and valving standard with main unit

The free—fall operation mode is designed to prevent load lowering even if the free—fall switch is accidentally activated.

The automatic brake mode meets all OSHA requirements for personnel handling.

#### **Boom Hoist Drum**

Contains a pilot controlled, bi-directional, axial piston motor and a planetary gear reduction unit to provide positive control under all load conditions.

- Spring applied, hydraulically released, disc type brake controlled automatically
- Drum lagging grooved for wire rope
- Drum pawl controlled automatically
- Mounted on anti-friction bearings
- 18.35 in (0.47m) root diameter
- 30.40 in (0.77m) flange diameter
- 11.16 in (0.28m) width

#### Swing System

Pilot controlled bi—directional axial piston motors and planetary gear reduction units to provide positive control under all load conditions.

- Spring applied, hydraulically released, 360° multi—plate brake
- Free swing mode when lever is in neutral position
- Four position positive house lock
- Two-speed swing
- · Audio/Visual swing alarm
- · Maximum swing speed is 2.5 rpm

#### Counterweight

Consists of a nine—piece design that can be easily lowered to the ground using the removal cylinders.

- "A" upper counterweight consists of one, 25,920 lb (11 757kg) base slab
- "B" upper counterweight consists of left, 9,410 lb (4 268kg) and right, 9,440 lb (4 282kg) counterweights
- "C" upper counterweight consists of left, 9,410 lb (4 268kg) and right, 9,440 lb (4 282kg) counterweights
- "D" upper counterweight consists of left, 8,050 lb (3 651kg) and right, 7,980 lb (3 619kg) counterweights
- Two carbody counterweights 13,250 lb (6 022kg) each

Total combined counterweight, "ABCD" plus carbody counterweights is 106,150 lb (48 149kg).

### **Operator Cab**

Fully enclosed modular steel compartment is independently mounted and padded to protect against vibration and noise.

- All tinted/tempered safety glass
- Folding hinge entry door and sliding front glass window
- · 19,000 BTU hot water heater
- · 18,600 BTU air conditioner
- · Door and window locks
- Circulating fan
- Sun visor
- Cloth seatDefroster
- · Windshield wipers and washer
- · Dry chemical fire extinguisher
- Engine instrumentation panel (voltmeter, engine oil pressure, engine water temperature, fuel level, hydraulic oil temperature, hour meter, and service monitor system)
- Electronic drum rotation indicators for front and rear hoist drums
- Rearview camera
- Six way adjustable seat
- Hand and foot throttle
- Fully adjustable single axis controls
- Swing lever with swing brake and horn located on handle
- · Bubble type level
- · Ergonomic gauge layout
- · Controls shut off lever
- Control stand is adjustable for operator comfort.

### Rated Capacity Limiter System

The HSL rated capacity limiter system is a boom hoist load cell system. This system provides the operator with useful geometrical data, to include:

- · Main Boom Length
- Main Boom Angle
- Jib Length
- Jib Angle
- Operating Mode
- Load Radius
- Boom Tip Height
- Audible Alarm
- · Pre-Warning Light
- · Overload Light
- Load On Hook
- · Function kick-outs including over load
- · Operator settable stops (ramped stops)
- Anti-Two Block Indicator
- · Boom hoist dead end load cell

#### **Boom Hoist System**

Designed to lift off maximum boom or maximum boom plus jib unassisted. Operates up to a maximum boom angle of 80° for conventional boom. Boom hoist limit system limits maximum boom angle operation.

- Pin—on bail frame
- 12—part reeving with 20mm (0.787 in) wire rope
- 22 ft (6.71m) live mast
- Two 1.25 in (32mm) pendants
- Tubular boom backstops (telescopic type)
- Sheaves contain sealed anti-friction bearings
- Boom speed from 10°-70° is 69 seconds with no load. Speed was determined using 100 ft (30.48m) of tube boom.

#### **Machinery Cab**

Hinged doors (five on right side, three on left side) for machinery access. Storage/rigging box located on operator's side of upper house. Equipped with rooftop access ladder and skid resistant finish on roof

#### Catwalks

Standard on right and left sides. Catwalks fold up or can be removed to reduce transport weight.



## Lower Structure

### Carbody

#### **Lower Frame**

All welded high strength steel [65,000 psi (448.16MPa) yield] box construction frame with precision machined surfaces for turntable bearing and rotating joint.

- 9 ft 9.6 in (2.98m) overall width
- 11 ft 6 in (3.50m) overall length

#### Side Frames

#### Side Frames

All welded, precision machined, steel frames can be hydraulically extended and retracted by a hydraulic cylinder mounted in the lower frame.

- 14 ft 6 in (4.42m) extended gauge
- 8 ft 9.6 in (2.68m) retracted gauge
- · 21 ft (6.4m) overall length
- 36 in (0.91m) wide track shoes
- · Sealed (oil filled) drive planetaries
- · Compact travel drives
- Automatic hydraulic track adjustment system

#### Track Rollers

- Ten sealed (oil filled) track rollers per side frame
- Heat treated, mounted on oil filled anti friction bearings

#### Tracks

Heat treated, self—cleaning, multiple hinged track shoes joined by one—piece full floating pins; 53 shoes per side frame

#### Take Up Idlers

Cast steel, heat treated, self-cleaning, mounted on aluminum/bronze bushings. Lubricated through idler shaft.

### Travel and Steering

#### Travel and Steering

Each side frame contains a pilot controlled, bi—directional, axial piston motor and a planetary gear reduction unit to provide positive control under all load conditions.

- Individual control provides smooth, precise maneuverability including full counter—rotation.
- Spring applied, hydraulically released disc type brake controlled automatically
- Maximum travel speed is 1.3 mph (2.15km/h).
- · Designed to 30% gradeability

#### Jack System

System contains four hydraulic cylinders individually pinned on swing out beams.

- Individual controls are mounted on carbody.
- Minimum height of carbody when resting on pontoons is 16 in (0.41m).
- Maximum height of carbody when resting on pontoons is 44 in (1.1m).

# Attachment and Options

## Conventional Tube Boom 45-235 ft (13.72-71.65m)

#### **Basic Boom**

45 ft (13.72m) two-piece design that utilizes a 20 ft (6.10m) base section and a 25 ft (7.62m) open throat top section with in-line connecting pins on 65 in (1.65m) wide and 54 in (1.37m) deep centers.

- Boom foot on 55.12 in (1.40m) centers
- 4 in (10.16cm) diameter chords
- · Lugs on base section for self assembly
- · Deflectorroller on top section
- Permanent skid pads mounted on top section to protect head machinery
- · Permanent stowable idler sheave pack
- · Quick reeve capable top section

- Five, 21.53 in, (54.69cm) root diameter polymide sheaves mounted on sealed anti-friction bearings
- Tip extension and jib connecting lugs on top section
- · Mechanical boom angle indicator
- · Self assembly cylinder optional

#### **Tube Boom Extensions**

The following table provides the lengths available and the suggested quantity to obtain maximum boom in 10 ft (3.05m) increments. Midpoint pendant connections are required at 100 ft (30.48m) for boom lengths of 215 ft (65.53m), 225 ft (68.58m), and 235 ft (71.6m).

 Polyamide wear blocks on top of each extension

|    | Boom<br>isions | Quantity For Max<br>Boom |  |
|----|----------------|--------------------------|--|
| ft | m              | Boom                     |  |
| 10 | 3.05           | 1                        |  |
| 20 | 6.10           | 2                        |  |
| 30 | 9.14           | 2                        |  |
| 40 | 12.19          | 2                        |  |

- Maximum tip height of 238 ft 7 in (72.73m)
- Boom connecting pins storage on each extension



### Angle Boom 45-155 ft (13.72-47.24m)

#### **Basic Angle Boom**

45 ft (13.72m) two—piece design that utilizes a 20 ft (6.10m) base section and a 25 ft (7.62m) top section with in—line connecting pins on 60 in (1.52m) wide and 54 in (1.37m) deep centers.

- Boom foot on 55.12 in (1.40m) centers
   4 in v 4 in v 9.5 in (10.16cm v 10.16cm v)
- 4 in x 4 in x 0.5 in (10.16cm x 10.16cm x 1.27cm) angle chords
- · Lugs on base section for self assembly
- · Deflectorroller on top section
- · Rigid quick reeve sheave guards
- Tip extension and jib connecting lugs on top section
- Three, 24.75 in, (62.87cm) root diameter lift sheaves mounted on sealed anti-friction bearings with rope guards
  - Four sheave for heavy lifting optional

#### **Angle Boom Extensions**

The following table provides the lengths available and the suggested quantity to obtain maximum boom in 10 ft (3.05m) increments. Midpoint pendant connections are not required.

| Angle Boom<br>Extensions |      | Quantity For Max |  |
|--------------------------|------|------------------|--|
| ft                       | m    | Boom             |  |
| 10                       | 3.05 | 1                |  |
| 20                       | 6.10 | 2                |  |
| 30                       | 9.14 | 2                |  |

- · Appropriate length pendants
- Maximum angle boom tip height of 160.51 ft (48.92m).

## Tube Jib 30-75 ft (9.14-22.86m)

### Basic Tube Jib

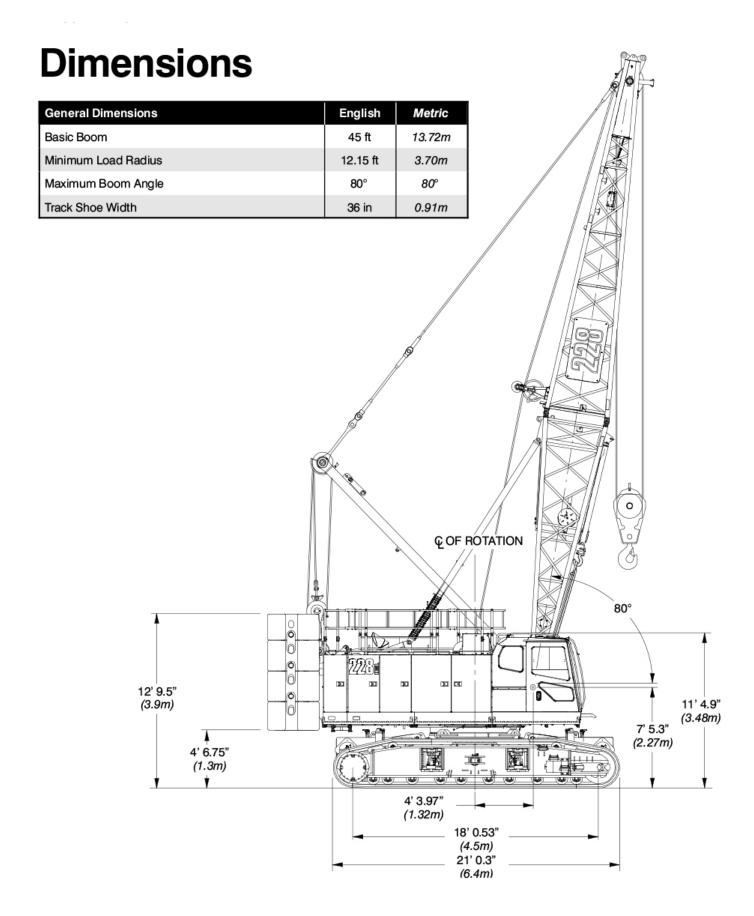
30 ft (9.14m) two—piece design that utilizes a 15 ft (4.57m) base section and a 15 ft (4.57m) top section with in—line connecting pins on 32 in (0.81m) wide and 24 in (0.61m) deep centers.

- 2 in (50.8mm) diameter chords
- One 18.50 in (0.47m) root diameter steel sheave mounted on sealed anti friction bearings

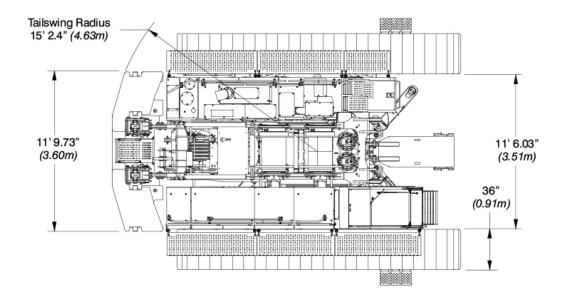
- 15 ft (4.57m) jib extensions provide jib lengths of 45 ft (13.72m), 60 ft (18.29m), and 75 ft (22.86m).
- Jib offset angles at 5°, 15°, and 25°
- The maximum tip height of boom + jib [205 ft + 75 ft (62.5 + 22.86m)] is 281.75 ft (85.93m).

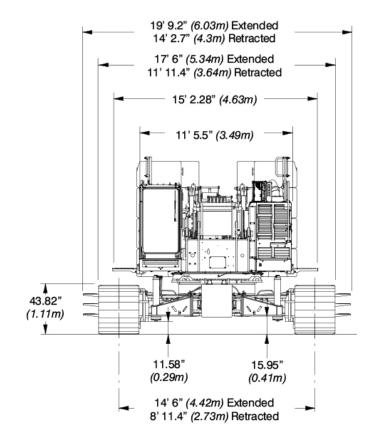
#### **Auxiliary Tip Extension**

Designed to use in place of jib to provide clearance between working hoist lines. The extension is equipped with two nylon 18 in (45.72cm) root diameter sheaves mounted on sealed anti—friction bearings. Maximum capacity is 18.5 Ton (16.78mt).









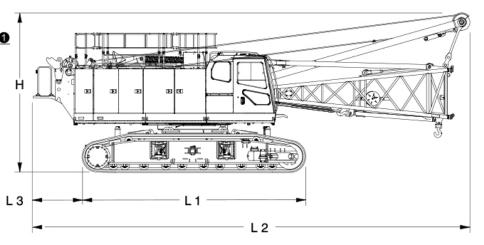


## **Base Crane**

## **Base Crane**

Length 1 21 ft (6.41m) Length 2 41 ft 1.65 in (12.54m) Length 3 4 ft 10.25 in (1.48m) Height 14 ft 6.6 in (4.44m)Weight:

Tube Boom 119,541 lb (54 224kg) Angle Boom 120,245 lb (54 543kg)



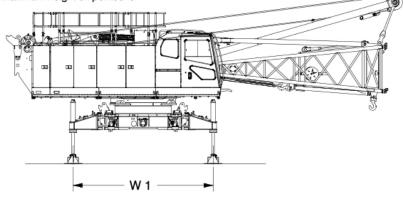
### Base Crane w/

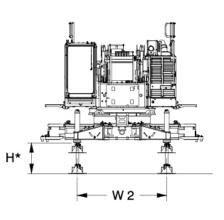
### Jacks

Width 1 14 ft 1 in (4.29m)8 ft 11 in Width 2 (2.74m)Height\* 44 in (1.12m)Weight:

Tube Boom 74,225 lb (33 668kg) (33 988kg) Angle Boom 74,929 lb

\* Maximum height on pontoons



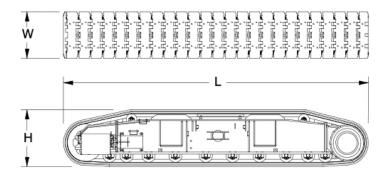


## **Side Frames**

#### **Side Frames**

Length 21 ft (6.41m)Width 36 in (0.91m) 3 ft 7.8" in Height (1.11m)Weight 22,877 lb (10 377kg)

Number inside black circle "0" = # of components





## **Upper Counterweights**

## "A" Slab Counterweight 0

| Length | 45.44 in      | (1.15m)    |
|--------|---------------|------------|
| Width  | 11 ft 9.75 in | (3.60m)    |
| Height | 6 ft 6 in     | (1.98m)    |
| Weight | 25,920 lb     | (11 757kg) |

## "B" Wing Counterweights @

| Length 1 | 55.12 in | (1.40m)   |
|----------|----------|-----------|
| Length 2 | 53 in    | (1.35m)   |
| Width    | 45.44 in | (1.15m)   |
| Height   | 29.44 in | (0.75m)   |
| Weight 1 | 9,418 lb | (4 272kg) |
| Weight 2 | 9,440 lb | (4 282kg) |

## "C" Wing Counterweights @

| Length 1 | 55.12 in | (1.40m)   |
|----------|----------|-----------|
| Length 2 | 53 in    | (1.35m)   |
| Width    | 45.44 in | (1.15m)   |
| Height   | 29.44 in | (0.75m)   |
| Weight 1 | 9,418 lb | (4 272kg) |
| Weight 2 | 9.440 lb | (4 282kg) |

## "D" Wing Counterweights @

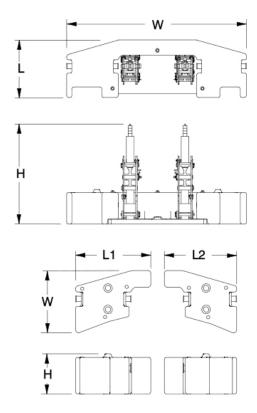
| Length 1 | 55.12 in | (1.40m)   |
|----------|----------|-----------|
| Length 2 | 53 in    | (1.35m)   |
| Width    | 45.44 in | (1.15m)   |
| Height   | 23.03 in | (0.58m)   |
| Weight 1 | 8,050 lb | (3 651kg) |
| Weight 2 | 7.980 lb | (3 620ka  |

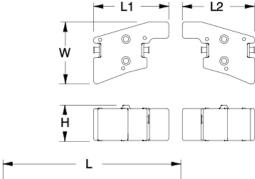
## **Lower Counterweights**

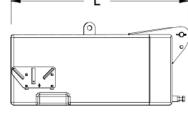
## Car Body Counterweights @

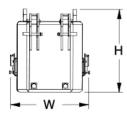
| Length | 6 ft 2 in | (1.89m)  |
|--------|-----------|----------|
| Width  | 32.44 in  | (1.82m)  |
| Height | 34.45 in  | (0.88m)  |
| Weight | 13,250 lb | (6 010kg |

Number inside black circle "0" = # of components











## **Boom**

## 65 in (1.65m) x 54 in (1.37m)

## **Tube Boom Extensions**

#### 10 ft (3.05m) Extension

| Length | 10 ft 7.9 in | (3.25m) |
|--------|--------------|---------|
| Width  | 70.62 in     | (1.79m) |
| Height | 63.81 in     | (1.62m) |
| Weight | 1,061 lb     | (481kg) |

#### 20 ft (6.10m) Extension

| Length | 20 ft 7.9 in | (6.30m) |
|--------|--------------|---------|
| Width  | 70.62 in     | (1.79m) |
| Height | 63.81 in     | (1.62m) |
| Weight | 1.613 lb     | (732kg) |

### 30 ft (9.14m) Extension

| Length  | 30 ft 7.9 in | (9.34m) |
|---------|--------------|---------|
| Width   | 70.62 in     | (1.79m) |
| Height  | 63.81 in     | (1.62m) |
| Weight: | 2,166 lb     | (982kg) |

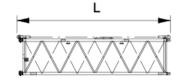
### 40 ft (12.19m) Extension

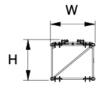
| Length  | 40 ft 7.9 in | (12.40m)  |
|---------|--------------|-----------|
| Width   | 70.62 in     | (1.79m)   |
| Height  | 63.81 in     | (1.62m)   |
| Weight: | 2,755 lb     | (1 250kg) |

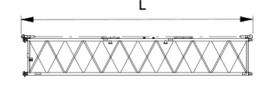




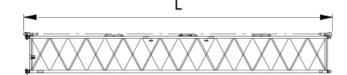












## 60 in (1.52m) x 54 in (1.37m)

## **Angle Boom Extensions**

### 10 ft (3.05m) Extension

| Length  | 10 ft 4 in | (12.40m)  |
|---------|------------|-----------|
| Width   | 65.62 in   | (1.67m)   |
| Height  | 58 in      | (1.47m)   |
| Weight: | 1,292 lb   | (586.2kg) |

### 20 ft (6.10m) Extension

| -       | -          |           |
|---------|------------|-----------|
| Length  | 20 ft 4 in | (12.40m)  |
| Width   | 65.62 in   | (1.67m)   |
| Height  | 58 in      | (1.47m)   |
| Weight: | 2.341 lb   | (1 062ka) |

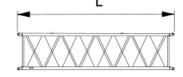
### 30 ft (9.14m) Extension

| Length  | 30 ft 4 in | (12.40m)  |
|---------|------------|-----------|
| Width   | 65.62 in   | (1.67m)   |
| Height  | 58 in      | (1.47m)   |
| Weight: | 3,137 lb   | (1 423kg) |

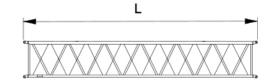














# 25 ft (7.62m) Tube Boom Top Section

| Length     | 27 ft 6 in      | (8.38m)   |         |
|------------|-----------------|-----------|---------|
| Width      | 68.5 in         | (1.74m)   |         |
| Deep       | 54 in           | (1.37m)   |         |
| Height     |                 |           |         |
| H1 – fold  | ed Idler sheave | 64.4 in   | (1.64m) |
| H2 - w/ le | dler sheave     | 89.6 in   | (2.28m) |
| Weight     | 3,588 lb        | (1 627kg) |         |

# 25 ft (7.62m) Angle Boom Top Section

| Length      | 27 ft 8.25 in | (8.44m)   |
|-------------|---------------|-----------|
| Width       | 61.87 in      | (1.57m)   |
| Deep        | 54 in         | (1.37m)   |
| Height      | 58 in         | (1.47m)   |
| Weight      |               |           |
| w/3 sheave  | es 876.6 lb   | (397.7kg) |
| w/ 4 sheave | s 1,071.4 lb  | (486.1kg) |

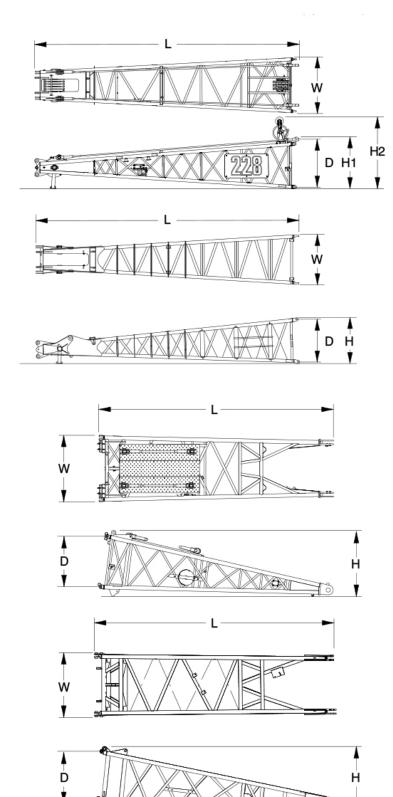
## 20 ft (6.10m) Tube Boom Base Section

| Length     | 20 ft 7.5 in | (6.29m)  |           |
|------------|--------------|----------|-----------|
| Width      | 70.60 in     | (1.79m)  |           |
| Deep       | 54 in        | (1.37m)  |           |
| Height     | 70.50 in     | (1.79m)  |           |
| Weight     |              |          |           |
| w/o Self A | ssembly      | 2,665 lb | (1 211kg) |
| w/ Self As | sembly       | 3.039 lb | (1 381ka) |

## 20 ft (6.10m) Angle Boom Base Section

| Length | 20 ft 7.5 in | (6.29m)   |
|--------|--------------|-----------|
| Width  | 65.50 in     | (1.66m)   |
| Deep   | 54 in        | (1.37m)   |
| Height | 65 in        | (1.65m)   |
| Weight | 3 174 lb     | (1 440kg) |

Number inside black circle " $m{0}$ " = # of components \* — Optional equipment

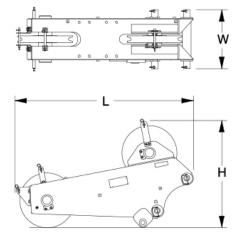


0



## Auxiliary Tip Extension\* 0

| Length | 70.35 in | (1.79m) |
|--------|----------|---------|
| Width  | 24.50 in | (0.62m) |
| Height | 42.91 in | (1.09m) |
| Weight | 720 lb   | (327kg) |



## **Fixed Jib**

## 15 ft (4.57m) Jib

| Top Section*        |               |         |  |
|---------------------|---------------|---------|--|
| Length              | 16 ft 1.50 in | (4.91m) |  |
| Width               | 34.50 in      | (0.88m) |  |
| Height              | 26.50 in      | (0.67m) |  |
| Weight <sup>†</sup> | 604 lb        | (274kg) |  |

† Weight includes pendants and hardware.

## 15 ft (4.57m) Jib Base Section\*

| 15 ft 3.50 in | (4.66m)                          |
|---------------|----------------------------------|
| 34.50 in      | (0.88m)                          |
| 26.50 in      | (0.67m)                          |
| 54.50 in      | (1.38m)                          |
| 1,106 lb      | (502kg)                          |
|               | 34.50 in<br>26.50 in<br>54.50 in |

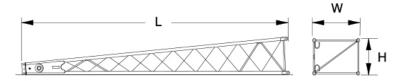
† Weight includes pins, basic frontstay & backstay pendants, and hardware.

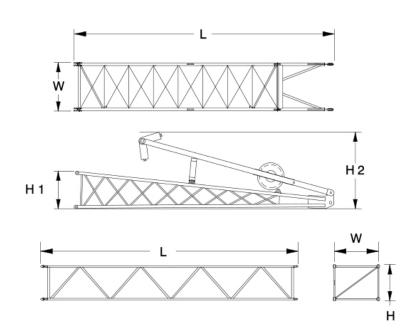
## 15 ft (4.57m) Jib Extension\*

| Length              | 15 ft 2.50 in | (4.64m) |
|---------------------|---------------|---------|
| Width               | 34.50 in      | (0.88m) |
| Height              | 26.50 in      | (0.67m) |
| Weight <sup>†</sup> | 330 lb        | (150kg) |

† Weights includes pins, pendants, and hardware.

Number inside black circle "●" = # of components \* — Optional equipment







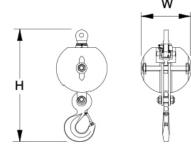
## **Hook Balls**

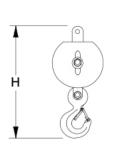
## 15 Ton (13.6mt) Swivel

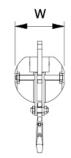
| Hook Ball* |          |         |  |  |  |  |  |  |  |  |  |
|------------|----------|---------|--|--|--|--|--|--|--|--|--|
| Width      | 17.50 in | (0.44m) |  |  |  |  |  |  |  |  |  |
| Height     | 40.50 in | (1.03m) |  |  |  |  |  |  |  |  |  |
| Weight     | 767 lb   | (348kg) |  |  |  |  |  |  |  |  |  |
|            |          |         |  |  |  |  |  |  |  |  |  |

# 15 Ton (13.6mt) Non-Swivel Hook Ball\*

| Width  | 18 in    | (0.46m) |
|--------|----------|---------|
| Height | 39.50 in | (1.00m) |
| Weight | 748 lb   | (339kg) |







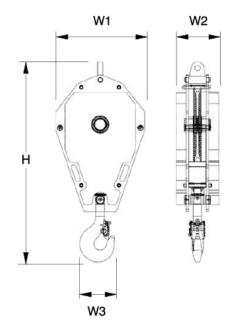
## **Hook Blocks**

30 Ton (22.7mt) 1-Sheave Quick Reeve

| Hook I | Block*   |         |
|--------|----------|---------|
| Width1 | 13.38 in | (0.34m) |
| Width2 | 27.44 in | (0.71m) |
| Width3 | 10.03 in | (0.25m) |
| Height | 63.06 in | (1.60m) |
| Weight | 1,700 lb | (771kg) |

0

Number inside black circle "●" = # of components \* — Optional equipment



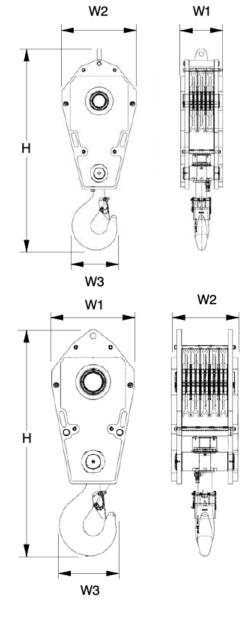


## 90 Ton (81.8mt) 3-Sheave Quick Reeve Hook

| Block* |          |           | 0 |
|--------|----------|-----------|---|
| Width1 | 15.81 in | (0.40m)   |   |
| Width2 | 27.94 in | (0.71m)   |   |
| Width3 | 15.75 in | (0.4m)    |   |
| Height | 75.88 in | (1.93m)   |   |
| Weight | 2,400 lb | (1 091kg) |   |

## 130 Ton (118.2mt) 5-Sheave Quick Reeve Hook Block\*

| Block* |          |           |  |
|--------|----------|-----------|--|
| Width1 | 22.50 in | (0.57m)   |  |
| Width2 | 27.94 in | (0.71m)   |  |
| Width3 | 18.26 in | (0.46m)   |  |
| Height | 76.56 in | (1.95m)   |  |
| Weight | 3,300 lb | (1 500kg) |  |
|        |          |           |  |



Number inside black circle "①" = # of components \* — Optional equipment

# **Working Weights**

| Based on basic crane including Cummins QSB6.7 T4f diesel engine,  |                              | Ctwt "A"            | Ctwt "AB"           | Ctwt "ABCD" +<br>"A" Lower Ctwt |
|---|------------------------------|---------------------|---------------------|---------------------------------|
| ing, live mast, 12 part boom hoist reeving, backstops, jacks, crawler lo (0.91m) wide track shoes, sealed track rollers, and catwalks, plus the f   | ollowing:                    | lb<br>(kg)          | lb<br>( <i>kg</i> ) | lb<br>( <i>kg</i> )             |
| Lifting crane — includes 45 ft (13.72m) basic tube, self assembly cylind (249.94m) of 26mm type "ZB" hoist rope, 650 ft (198.12m) of 26mm type rope, 130 Ton (118.2mt) 5—sheave hook block, and basic pendants. | der, 820 ft<br>pe "ZB" hoist | 154,937<br>(70 279) | 173,677<br>(78 780) | 235,041<br>(106 614)            |
| Craying Bearing Processor   | psi                          | 8.10                | 9.27                | 11.80                           |
| Ground Bearing Pressure   | kg/cm²                       | 0.57                | 0.65                | 0.83                            |



# Transport Weights w/ Side Frames

Base Crane: 20' Tube Base Section, Rigid Boom Backstops, 110 gal (416L) of Fuel. Catwalks (Front and Right Side), Side Frames, 22' (6.7m) Live Mast, Bridle & Spreader Bar, 12—part Boom Hoist Reeving, 820' (249.94m) Of Type "ZB" Front Hoist Rope, 650' (198.12m) Of Type "ZB" Rear Hoist Rope.

| tom Description  | Gross                                   | Gross Weight |          |        | Transport Loads |        |        |  |  |
|--|---|--------------|----------|--------|-----------------|--------|--------|--|--|
| Item Description   | lb                                      | kg           | #1       | #2     | #3              | #4     | #5     |  |  |
| Base Crane   | 119,541                                 | 54,224       | 1        |        |                 |        |        |  |  |
| Base Counterweight w/ Cylinders  | 25,900                                  | 11,748       |          | 1      |                 |        |        |  |  |
| Add Upper Counterweight Wing (Right)   | 9,440                                   | 4,282        |          |        | 1               | 1      |        |  |  |
| Add Upper Counterweight Wing (Left)  | 9,410                                   | 4,268        |          |        |                 | 2      |        |  |  |
| Add T4 Upper Counterweight Wing (Right)  | 7,980                                   | 3,620        |          | 1      |                 |        |        |  |  |
| Add T4 Upper Counterweight Wing (Left)   | 8,050                                   | 3,651        |          |        |                 |        | 1      |  |  |
| Add Lower Frame Counterweight  | 13,300                                  | 6,033        |          |        |                 |        | 2      |  |  |
| Add Lower Jacking System   | 2,700                                   | 1,225        |          |        |                 |        |        |  |  |
| Add Hydraulic Third Drum without Rope  | 1,850                                   | 839          |          |        |                 |        |        |  |  |
| Add Hydraulic Fourth Drum without Rope   | 4,367                                   | 1,981        |          |        |                 |        |        |  |  |
| Add 25' (7.62m) Tube Top Section   | 3,496                                   | 1,586        |          |        | 1               |        |        |  |  |
| Add 10 ft (3.05m) Tube Extension w/Pins and Pendants   | 969                                     | 440          |          | 1      |                 |        |        |  |  |
| Add 20 ft (6.10m) Tube Extension w/Pins and Pendants   | 1,569                                   | 712          |          | -      |                 | 1      | 1      |  |  |
| Add 30 ft (9.14m) Tube Extension w/Pins and Pendants   | 2,171                                   | 985          |          |        | 1               |        | 1      |  |  |
| Add 40 ft (12.19m) Tube Extension w/Pins and Pendants  | 2,760                                   | 1,252        |          | 1      |                 | 1      |        |  |  |
| Add 20' (6.1m) Angle Base Section w/ Backstops   | 4,700                                   | 2,132        |          |        |                 |        |        |  |  |
| Add 25' (7.62m) Angle Top Section (3 Sheaves)  | 4,994                                   | 2,265        |          |        |                 |        |        |  |  |
| Add 25' (7.62m) Angle Top Section (4 Sheaves)  | 5,180                                   | 2,350        |          |        |                 |        |        |  |  |
| Add 10 ft (3.05m) Angle Extension w/Pins and Pendants  | 1,581                                   | 717          |          |        |                 |        |        |  |  |
| Add 20 ft (6.10m) Angle Extension w/Pins and Pendants  | 2,700                                   | 1,225        |          |        |                 |        |        |  |  |
| Add 30 ft (9.14m) Angle Extension w/Pins and Pendants  | 3,566                                   | 1,618        |          |        |                 |        |        |  |  |
| Add Quick Draw Assembly  | 3,300                                   | 154          | 1        |        |                 |        |        |  |  |
| Add 30' (9.1m) Tube Jib  | 1,640                                   | 744          | <u> </u> | 1      |                 |        |        |  |  |
| Add 15' (4.6m) Tube Jib Extension  | 270                                     | 122          |          |        |                 |        | 3      |  |  |
| Add 13 (4.6m) lube 310 Extension Add 5' (1.5m) Auxiliary Tip Extension w/ Nylon Sheave                     | 720                                     | 327          |          |        |                 |        | 3      |  |  |
| Add 5 (1.5m) Auxiliary Tip Extension w/ Nylon Sheave Add 5' (1.5m) Auxiliary Tip Extension w/ Steel Sheave | 1,000                                   | 454          |          |        |                 |        |        |  |  |
| Add 9 (1.511) Adxillary rip extension w/ Steel Sheave  | 1,000                                   | 90           |          |        |                 |        |        |  |  |
| Add Hoist Rope - 26mm x 820' Type "YB"   | 1,870                                   | 848          |          |        |                 |        |        |  |  |
| ***  | , |              |          |        |                 |        |        |  |  |
| Add Jib Wire Rope - 26mm x 650' Type "YB"  | 1,482<br>572                            | 672<br>259   |          |        |                 |        |        |  |  |
| Add 3rd Drum Wire Rope - 0.75" x 550' type "DB"  |   | 520          |          |        |                 |        |        |  |  |
| Add 4th Drum Wire Rope - 26mm x 620' type "RB"   | 1,147                                   |              |          |        |                 |        |        |  |  |
| Add 15 Ton (13.6mt) Hook Ball (Nonswivel)  | 750                                     | 340          |          |        |                 |        |        |  |  |
| Add 15 Ton (13.6mt) Hook Ball (Swivel)   | 767                                     | 348          |          |        | 1               |        |        |  |  |
| Add 30 Ton (27.3mt) 1 Sheave Quick Reeve Hook Block  | 1,700                                   | 771          |          |        |                 |        |        |  |  |
| Add 90 Ton (81.8mt) 3 Sheave Quick Reeve Hook Block  | 2,400                                   | 1,089        |          |        |                 |        |        |  |  |
| Add 130-ton (100mt) 4 Sheave Hook Block  | 3,300                                   | 1,497        |          |        |                 | 1      |        |  |  |
| Remove Live Mast   | -2,082                                  | -944         |          |        |                 |        |        |  |  |
| Remove 20' (6.1m) Tube Base Section w/ Backstops   | -3,996                                  | -1,813       |          |        |                 |        |        |  |  |
| Remove Hoist Rope - 26mm x 820' Type "ZB"  | -1,747                                  | -792         |          |        |                 |        |        |  |  |
| Remove Boom Hoist Rope - 20mm x 470' Type "DB"   | -541                                    | -245         |          |        |                 |        |        |  |  |
| Remove Jib Wire Rope - 26mm x 650' Type "ZB"   | -1,385                                  | -628         |          |        |                 |        |        |  |  |
| Remove 110 gal (416L) of Fuel  | -797                                    | -362         |          |        |                 |        |        |  |  |
| Remove Side Frames   | -45,316                                 | -20,555      |          |        |                 |        |        |  |  |
| Approximate Total Shipping Weight  |   | Ь            | 119,881  | 39,249 | 15,874          | 35,889 | 39,200 |  |  |
|  | k                                       | g            | 54,378   | 17,803 | 7,200           | 16,297 | 17,781 |  |  |

Notes: Estimated weights vary by  $\pm$  2%. Numbers in the load columns (numbers 1–5) represent quantities. Estimated transport loads assume the load out consist of 230' (70.1m) of tube boom and 75' (22.86m) of jib with full counterweight. Support loads were targeted at 45,000 lb (20 412kg), 8' 6" (2.6m) wide, 48' (14.6m) long, and 13' 6" (4.1m) high using a drop deck trailer. This may vary depending on state laws, empty truck/trailer weights, and style of trailer.



# Transport Weights w/o Side Frames

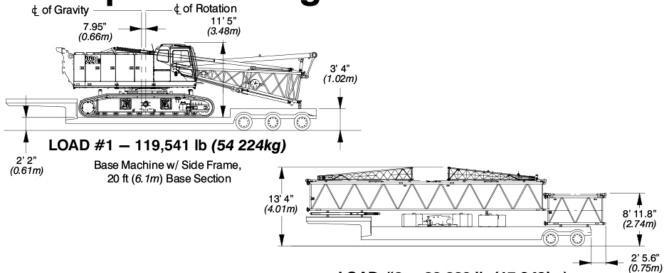
Base Crane: 20' Tube Base Section, Rigid Boom Backstops, 110 gal (416L) of Fuel. Catwalks (Front and Right Side), 22' (6.7m) Live Mast, Bridle & Spreader Bar, 12—part Boom Hoist Reeving, 820' (249.94m) Of Type "ZB" Front Hoist Rope, 650' (198.12m) Of Type "ZB" Rear Hoist Rope.

| Item Description                                      | Gross  | Gross Weight |        |        | Transport Loads |        |        |       |  |
|---|--------|--------------|--------|--------|-----------------|--------|--------|-------|--|
| Item Description                                      | lb     | kg           | #1     | #2     | #3              | #4     | #5     | #6    |  |
| Base Crane  | 74,225 | 33,668       | 1      |        |                 |        |        |       |  |
| Base Counterweight w/ Cylinders                       | 25,900 | 11,748       |        | 1      |                 |        |        |       |  |
| Add Upper Counterweight Wing (Right)                  | 9,440  | 4,282        |        |        | 1               | 1      |        |       |  |
| Add Upper Counterweight Wing (Left)                   | 9,410  | 4,268        |        |        |                 | 2      |        |       |  |
| Add T4 Upper Counterweight Wing (Right)               | 7,980  | 3,620        |        | 1      |                 |        |        |       |  |
| Add T4 Upper Counterweight Wing (Left)                | 8,050  | 3,651        |        |        |                 |        | 1      |       |  |
| Add Lower Frame Counterweight                         | 13,300 | 6,033        |        |        |                 |        | 2      |       |  |
| Add Lower Jacking System                              | 2,700  | 1,225        |        |        |                 |        |        |       |  |
| Add Hydraulic Third Drum without Rope                 | 1,850  | 839          |        |        |                 |        |        |       |  |
| Add Hydraulic Fourth Drum without Rope                | 4,367  | 1,981        |        |        |                 |        |        |       |  |
| Add 25' (7.62m) Tube Top Section                      | 3,496  | 1,586        |        |        | 1               |        |        |       |  |
| Add 10 ft (3.05m) Tube Extension w/Pins and Pendants  | 969    | 440          |        | 1      |                 |        |        |       |  |
| Add 20 ft (6.10m) Tube Extension w/Pins and Pendants  | 1,569  | 712          |        |        |                 | 1      | 1      |       |  |
| Add 30 ft (9.14m) Tube Extension w/Pins and Pendants  | 2,171  | 985          |        |        | 1               |        | 1      |       |  |
| Add 40 ft (12.19m) Tube Extension w/Pins and Pendants | 2,760  | 1,252        |        | 1      | -               | 1      |        |       |  |
| Add 20' (6.1m) Angle Base Section w/ Backstops        | 4,700  | 2,132        |        |        |                 |        |        |       |  |
| Add 25' (7.62m) Angle Top Section (3 Sheaves)         | 4,994  | 2,265        |        |        |                 |        |        |       |  |
| Add 25' (7.62m) Angle Top Section (4 Sheaves)         | 5,180  | 2,350        |        |        |                 |        |        |       |  |
| Add 10 ft (3.05m) Angle Extension w/Pins and Pendants | 1,581  | 717          |        |        |                 |        |        |       |  |
| Add 20 ft (6.10m) Angle Extension w/Pins and Pendants | 2,700  | 1,225        |        |        |                 |        |        |       |  |
| Add 30 ft (9.14m) Angle Extension w/Pins and Pendants | 3,566  | 1,618        |        |        |                 |        |        |       |  |
| Add Quick Draw Assembly                               | 340    | 154          | 1      |        |                 |        |        |       |  |
| Add 30' (9.1m) Tube Jib                               | 1,640  | 744          |        | 1      |                 |        |        |       |  |
| Add 15' (4.6m) Tube Jib Extension                     | 270    | 122          |        | '      |                 |        | 3      |       |  |
| Add 5' (1.5m) Auxiliary Tip Extension w/ Nylon Sheave | 720    | 327          |        |        |                 |        |        |       |  |
| Add 5' (1.5m) Auxiliary Tip Extension w/ Nylon Sheave | 1,000  | 454          |        |        |                 |        |        |       |  |
| Add Pile Driver Lead Adaptor                          | 198    | 90           |        |        |                 |        |        |       |  |
| Add Hoist Rope - 26mm x 820" Type "YB"                | 1,870  | 848          |        |        |                 |        |        |       |  |
| Add Jib Wire Rope - 26mm x 650' Type "YB"             | 1,482  | 672          |        |        |                 |        |        |       |  |
| Add 3rd Drum Wire Rope - 0.75" x 550' type "DB"       | 572    | 259          |        |        |                 |        |        |       |  |
| Add 4th Drum Wire Rope - 26mm x 620' type "RB"        | 1,147  | 520          |        |        |                 |        |        |       |  |
| Add 15 Ton (13.6mt) Hook Ball (Nonswivel)             | 750    | 340          |        |        |                 |        |        |       |  |
| Add 15 fon (13.6mt) Hook Ball (Non-swivel)            | 767    | 348          |        |        | 1               |        |        |       |  |
| Add 30 Ton (27.3mt) 1 Sheave Quick Reeve Hook Block   | 1,700  | 771          |        |        | '               |        |        |       |  |
|   | 2,400  | 1,089        |        |        |                 |        |        |       |  |
| Add 90 Ton (81.8mt) 3 Sheave Quick Reeve Hook Block   |        |              |        |        |                 | 1      |        |       |  |
| Add 130-ton (100mt) 4 Sheave Hook Block               | 3,300  | 1,497        |        |        |                 | '      |        |       |  |
| Remove Live Mast                                      | -2,082 |              |        |        |                 |        |        |       |  |
| Remove 20' (6.1m) Tube Base Section w/ Backstops      | -3,996 | -1,813       |        |        |                 |        |        |       |  |
| Remove Hoist Rope - 26mm x 820" Type "ZB"             | -1,747 | -792         |        |        |                 |        |        |       |  |
| Remove Boom Hoist Rope - 20mm x 470' Type "DB"        | -541   | -245         |        |        |                 |        |        |       |  |
| Remove Jib Wire Rope - 26mm x 650' Type "ZB"          | -1,385 | -628         |        |        |                 |        |        |       |  |
| Remove 110 gal (416L) of Fuel                         | -797   | -362         |        |        |                 |        |        |       |  |
| Add Side Frames                                       | 45,316 | 20,555       |        | 00.000 |                 | 05.000 | 00.000 | 1     |  |
| Approximate Total Shipping Weight                     |        | b            | 74,565 | 39,249 |                 | 35,889 | 39,200 | 45,31 |  |
|   |        | g            | 33,823 | 17,803 | 7,200           | 16,297 | 17,799 | 20,55 |  |

Notes: Estimated weights vary by  $\pm$  2%. Numbers in the load columns (numbers 1-5) represent quantities. Estimated transport loads assume the load out consist of 230' (70.1m) of tube boom and 75' (22.86m) of jib with full counterweight. Support loads were targeted at 45,000 lb (20 412kg), 8' 6" (2.6m) wide, 48' (14.6m) long, and 13' 6" (4.1m) high using a drop deck trailer. This may vary depending on state laws, empty truck/trailer weights, and style of trailer.

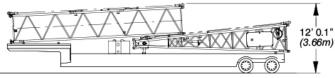


## Transport Drawings — Tube Boom



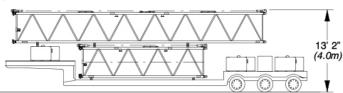
LOAD #2 - 39,336 lb (17 843kg)

10 ft (3.0m) boom extension, 40 ft (12.2m) boom extension, one 8,050 lb (3 651kg) counterweight, one 25,900 lb (11 748kg) counterweight, 30 ft (9.1m) basic jib



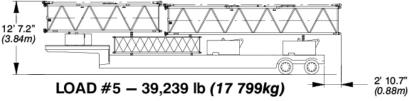
#### LOAD #3 - 15,869 lb (7 198kg)

30 ft (9.14m) boom extension, 25 ft (7.62m) peak section, one 9,370 lb (4.250kg) counterweight



#### LOAD #4 - 35,928 lb (16 297kg)

Two 9,410 lb (4 268kg) counterweights, one 9,370 lb (4 250kg) counterweight, 40 ft (12.19m) boom extension, 20 ft (9.14m) boom extension, and one 130 ton (117.9mt) hook block



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30 ft (9.14m) boom extension, 20 ft (6.10m) boom extension, three 15 ft (4.6m) jib extensions, two 13,200 lb (5 988kg) counterweights, one 8,068 lb (3 660kg) counterweight



## **Load Hoist Performance**

Front or Rear Drum - 26mm Wire Rope

| Rope  | Maximum | Maximum Line Pull |        | um Line Pull No Load Line Speed |        | Full Load L | Full Load Line Speed |     | Pitch Diameter |      | Layer   |       | Total |  |
|-------|---------|-------------------|--------|---------------------------------|--------|-------------|----------------------|-----|----------------|------|---------|-------|-------|--|
| Layer | lb      | kg                | ft/min | m/min                           | ft/min | m/min       | in                   | mm  | ft             | m    | ft      | m     |       |  |
| 1     | 44,565  | 20 214            | 348    | 106                             | 72     | 22          | 22.8                 | 580 | 137.5          | 41.9 | 137.5   | 41.9  |       |  |
| 2     | 40,898  | 18 551            | 380    | 116                             | 79     | 24          | 24.9                 | 632 | 148.0          | 45.1 | 285.5   | 87.0  |       |  |
| 3     | 37,789  | 17 141            | 411    | 125                             | 85     | 26          | 26.9                 | 684 | 158.5          | 48.3 | 444.0   | 135.3 |       |  |
| 4     | 35,119  | 15 930            | 442    | 135                             | 92     | 28          | 29.0                 | 736 | 169.0          | 51.5 | 612.9   | 186.8 |       |  |
| 5     | 32,801  | 14 879            | 473    | 144                             | 98     | 30          | 31.0                 | 788 | 179.5          | 54.7 | 792.4   | 241.5 |       |  |
| 6     | 30,771  | 13 958            | 505    | 154                             | 105    | 32          | 33.1                 | 840 | 190.0          | 57.9 | 982.4   | 299.4 |       |  |
| 7     | 28,977  | 13 144            | 536    | 163                             | 111    | 34          | 35.1                 | 892 | 200.4          | 61.1 | 1 182.8 | 360.5 |       |  |

Boom Hoist Drum - 20mm Wire Rope

| Rope  | Maximum Line Pull |        | No Load Line Speed |       | Full Load Line Speed |       | Pitch Diameter |     | Layer |      | Total |       |
|-------|-------------------|--------|--------------------|-------|----------------------|-------|----------------|-----|-------|------|-------|-------|
| Layer | lb                | kg     | ft/min             | m/min | ft/min               | m/min | in             | mm  | ft    | m    | ft    | m     |
| 1     | 34,311            | 15 563 | 152                | 46    | 32                   | 10    | 19.1           | 486 | 65.1  | 19.8 | 65.1  | 19.8  |
| 2     | 31,702            | 14 380 | 165                | 50    | 34                   | 10    | 20.7           | 526 | 69.7  | 21.2 | 134.8 | 41.1  |
| 3     | 29,462            | 13 364 | 177                | 54    | 37                   | 11    | 22.3           | 566 | 74.2  | 22.6 | 209.0 | 63.7  |
| 4     | 27,517            | 12 482 | 190                | 58    | 39                   | 12    | 23.9           | 606 | 78.8  | 24.0 | 287.8 | 87.7  |
| 5     | 25,813            | 11 709 | 203                | 62    | 42                   | 13    | 25.4           | 646 | 83.4  | 25.4 | 371.2 | 113.1 |
| 6     | 24,308            | 11 026 | 215                | 66    | 45                   | 14    | 27.0           | 686 | 87.9  | 26.8 | 459.1 | 139.9 |
| 7     | 22,969            | 10 418 | 228                | 69    | 47                   | 14    | 28.6           | 726 | 92.5  | 28.2 | 551.6 | 168.1 |

Rear Mounted Fourth Drum - 26mm Wire Rope

| Rope  | Maximum Line Pull |        | No Load Line Speed |       | Full Load Line Speed |       | Pitch Diameter |     | Layer |      | Total |       |
|-------|-------------------|--------|--------------------|-------|----------------------|-------|----------------|-----|-------|------|-------|-------|
| Layer | lb                | kg     | ft/min             | m/min | ft/min               | m/min | in             | mm  | ft    | m    | ft    | m     |
| 1     | 44,565            | 20 214 | 241                | 74    | 50                   | 15    | 22.8           | 580 | 119.6 | 36.4 | 119.6 | 36.4  |
| 2     | 40,898            | 18 551 | 263                | 80    | 55                   | 17    | 24.9           | 632 | 128.7 | 39.2 | 248.2 | 75.7  |
| 3     | 37,789            | 17 141 | 285                | 87    | 59                   | 18    | 26.9           | 684 | 137.8 | 42.0 | 386.1 | 117.7 |
| 4     | 35,119            | 15 930 | 306                | 93    | 64                   | 19    | 29.0           | 736 | 146.9 | 44.8 | 533.0 | 162.5 |
| 5     | 32,801            | 14 879 | 328                | 100   | 68                   | 21    | 31.0           | 788 | 156.1 | 47.6 | 689.0 | 210.0 |

## Front Mounted Third Drum - 3/4" (19mm) Wire Rope

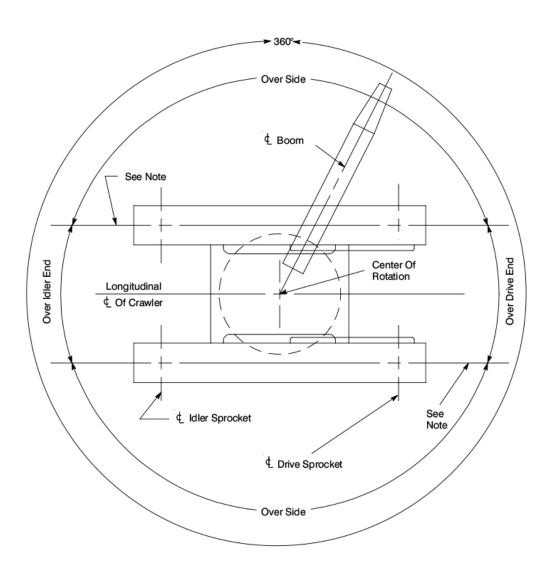
| Rope  | Maximum Line Pull |        | No Load Line Speed |       | Full Load Line Speed |       | Pitch D | iameter | Lay | yer  | To  | tal   |
|-------|-------------------|--------|--------------------|-------|----------------------|-------|---------|---------|-----|------|-----|-------|
| Layer | lb                | kg     | ft/min             | m/min | ft/min               | m/min | in      | mm      | ft  | m    | ft  | m     |
| 1     | 23,000            | 10 433 | 160                | 48.8  | 102                  | 31.1  | 13.5    | 343     | 80  | 24.4 | 80  | 24.4  |
| 2     | 20,700            | 9 390  | 178                | 54.3  | 114                  | 34.7  | 15      | 381     | 89  | 27.1 | 169 | 51.5  |
| 3     | 18,820            | 8 537  | 196                | 59.7  | 125                  | 38.1  | 16.5    | 419     | 98  | 29.9 | 267 | 81.4  |
| 4     | 17,250            | 7 825  | 214                | 65.2  | 137                  | 41.8  | 18      | 457     | 107 | 32.6 | 374 | 114.0 |
| 5     | 15,925            | 7 224  | 232                | 70.7  | 148                  | 45.1  | 19.5    | 495     | 116 | 35.4 | 490 | 149.4 |
| 6     | 14,785            | 6 706  | 249                | 75.9  | 160                  | 48.8  | 21      | 533     | 124 | 37.8 | 614 | 187.1 |

| Wire Dane Application  | Dian | neter | Time | Max. Permi | ssible Load | Miles Dana Daggintians   |
|------------------------|------|-------|------|------------|-------------|--|
| Wire Rope Application  | in   | mm    | Туре | lb         | kg          | Wire Rope Descriptions   |
| Boom Hoist             |      | 20    | DB   | 18,500     | 8 391       | 6 X 26 (6 X 19 Class), Warrington Seale, E.I.P.S., Preformed, Right<br>Regular Lay, I.W.R.C.   |
| Front Drum             |      | 26    | ZB   | 29,200     | 13 224      | 34 X 7 Rotation Resistant — Extra Improved Plow Steele, Right<br>Regular Lay or Right Lang Lay |
| Fourth Drum (Optional) |      | 26    | ZB   | 29,200     | 13 224      | 34 X 7 Rotation Resistant — Extra Improved Plow Steele, Right<br>Regular Lay or Right Lang Lay |
| Rear Drum              |      | 26    | ZB   | 29,200     | 13 224      | 18 X 19 Rotation Resistant Compacted Strand — High Strength —<br>Preformed, Right Regular Lay  |
| Third Drum (Optional)  | 3/4  | 19    | DB   | 16,800     | 7 620       | 6 X 26 (6 X 19 Class), Warrington Seale, E.I.P.S., Preformed, Right<br>Regular Lay, I.W.R.C.   |

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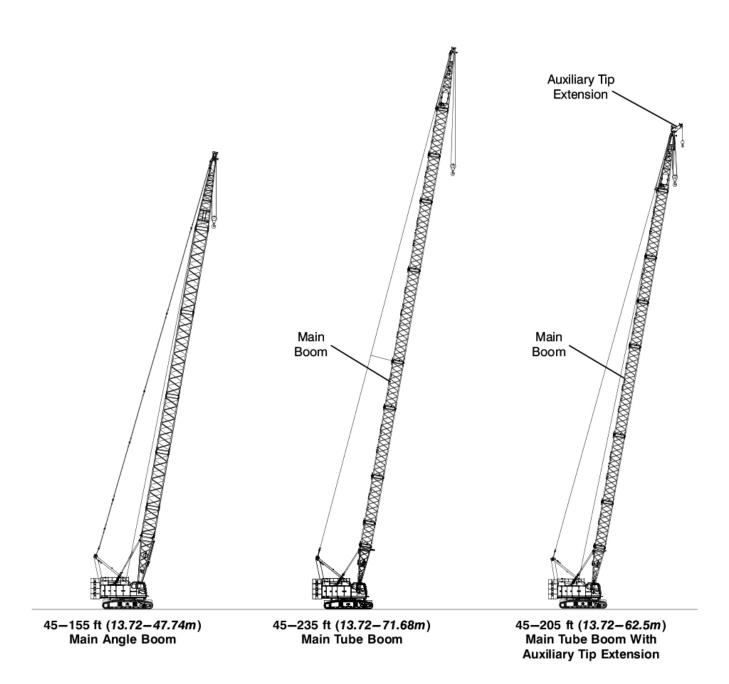
# **Working Areas**

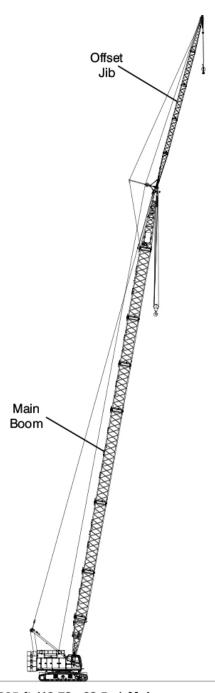


Note: These Lines Determine The Limiting Position Of Any Load For Operation Within Working Areas Indicated.



## **Attachments**





45-205 ft (13.72-62.5m) Main Tube Boom With 30-75 ft (9.14-22.86m) Offset Jib

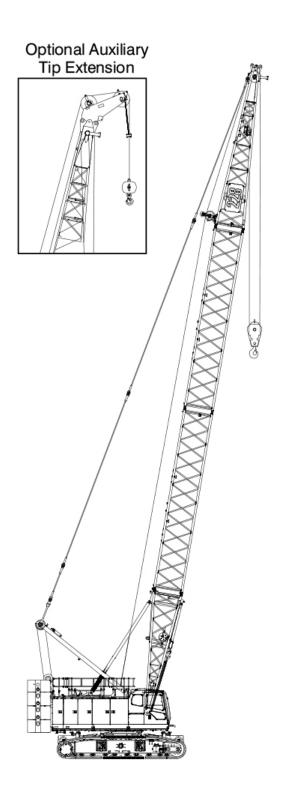


# Main Boom Make-up

## Tube Boom Make-Up

| Boom               |           | Tube Boom Ex | tensions ft (m) |            |
|--------------------|-----------|--------------|-----------------|------------|
| Length<br>ft (m)   | 10 (3.05) | 20 (6.14)    | 30 (9.10)       | 40 (12.19) |
| 45 (13.72)         |           |              |                 |            |
| 55 (16.76)         | 1         |              |                 |            |
| 65 (19.81)         |           | 1            |                 |            |
| 75 (22.86)         |           |              | 1               |            |
| 85 (25.91)         |           |              |                 | 1          |
| 95 (28.96)         | 1         |              |                 | 1          |
| 105 (32.00)        |           | 1            |                 | 1          |
| 115 (35.05)        |           |              | 1               | 1          |
| 125 (38.10)        |           |              |                 | 2          |
| 135 (41.15)        | 1         |              |                 | 2          |
| 145 (44.20)        |           | 1            |                 | 2          |
| 155 (47.24)        |           |              | 1               | 2          |
| 165 (50.29)        | 1         |              | 1               | 2          |
| 175 (53.34)        |           | 1            | 1               | 2          |
| 185 (56.39)        | 1         | 1            | 1               | 2          |
| 195 <i>(59.44)</i> | 1         |              | 2               | 2          |
| 205 (62.48)        |           | 1            | 2               | 2          |
| 215 (65.53)        | 1         | 1            | 2               | 2          |
| 225 (68.85)        |           | 2            | 2               | 2          |
| 235 (71.63)        | 1         | 2            | 2               | 2          |

- Capacities shown are in kips/metric tons (1 kip = 1,000 lb / 1 metric ton = 0.45 kips) and are not more than 75% of the tipping loads with the crane standing level on firm supporting surface. A deduction must be made from these capacities for weight of hook block, hook ball, sling, grapple, bad weighing device, etc. When using main hook while jib or tip extension is attached, reduce capacities by values shown in Crane Rating Manual. See Operator's Manual for all limitations when raising or lowering attachment.
- The capacities in the shaded areas are based on structural strength. The capacities in the non—shaded areas are based on stability ratings.
- For recommended reeving, parts of line, wire rope type, and wire rope inspection, see Wire Rope Capacity Chart, Operator's Manual, and Parts Manual.
- 4. Load ratings are based on freely suspended loads and make no allowances for such factors as the effect of the wind, ground conditions, and operating speeds. The operator shall therefore reduce load ratings in order to take these conditions into account. Refer to the Crane Rating Manual for Wind Speed Restrictions.
- The 26 ft (7.92m) live mast must be used for all capacities listed.
- 6. The least stable rated condition is over the side.
- Booms must be erected and lowered over the end for maximum stability.
- 8. Main boom length must not exceed 235 ft (71.63m).



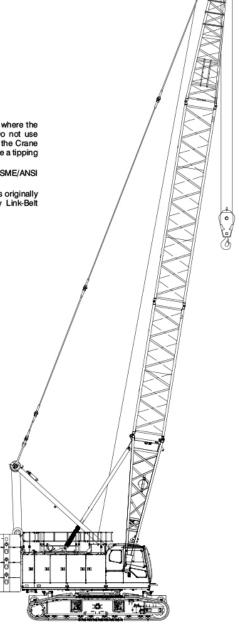


## Angle Boom Make-Up

| Boom<br>Length     | Angle E           | oom Extension | s ft (m)  |
|--------------------|-------------------|---------------|-----------|
| ft (m)             | 10 <i>(3.0</i> 5) | 20 (6.14)     | 30 (9.10) |
| 45 (13.72)         |                   |               |           |
| 55 (16.76)         | 1                 |               |           |
| 65 (19.81)         |                   | 1             |           |
| 75 (22.86)         |                   |               | 1         |
| 85 (25.91)         | 1                 |               | 1         |
| 95 (28.96)         |                   | 1             | 1         |
| 105 (32.00)        |                   |               | 2         |
| 115 <i>(35.05)</i> | 1                 |               | 2         |
| 125 (38.10)        |                   | 1             | 2         |
| 135 (41.15)        |                   |               | 3         |
| 145 (44.20)        | 1                 |               | 3         |
| 155 (47.24)        |                   | 1             | 3         |

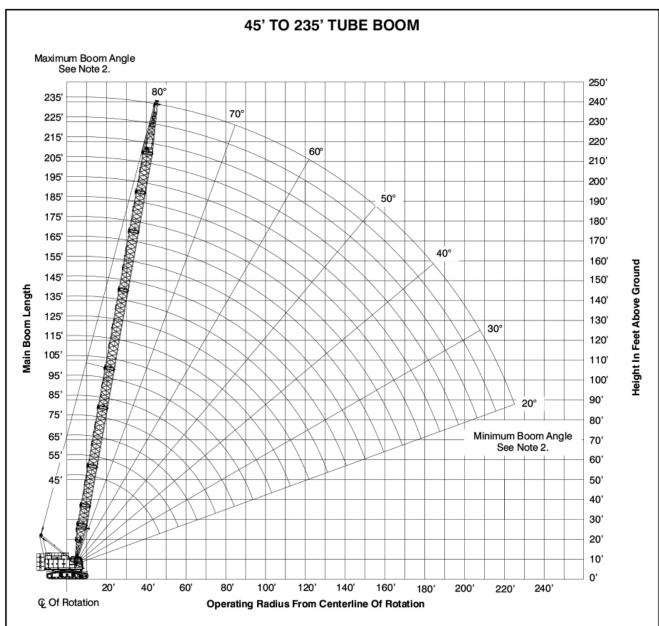
- Capacities shown are in kips/metric tons (1 kip = 1,000 lb/ 1 metric ton = 0.45 kips) and are not more than 75% of the tipping loads with the crane standing level on firm supporting surface. A deduction must be made from these capacities for weight of hook block, hook ball, sling, grapple, bad weighing device, etc. When using main hook while jib or tip extension is attached, reduce capacities by values shown in Crane Rating Manual. See Operator's Manual for all limitations when raising or lowering attachment.
- The capacities in the shaded areas are based on structural strength. The capacities in the non—shaded areas are based on stability ratings.
- For recommended reeving, parts of line, wire rope type, and wire rope inspection, see Wire Rope Capacity Chart, Operator's Manual, and Parts Manual.
- 4. Load ratings are based on freely suspended loads and make no allowances for such factors as the effect of the wind, ground conditions, and operating speeds. The operator shall therefore reduce load ratings in order to take these conditions into account. Refer to the Crane Rating Manual for Wind Speed Restrictions.
- The 22 ft (6.71m) live mast must be used for all capacities listed.
- 6. The least stable rated condition is over the side.
- Booms must be erected and lowered over the end for maximum stability.
- 8. Main boom length must not exceed 155 ft (47.24m).

- 9. Do not operate at radii and boom lengths where the Crane Rating Manual lists no capacity. Do not use longer booms or jibs than those listed in the Crane Rating Manual. Any of the above can cause a tipping condition, or boom and jib failure.
- These capacities are in compliance with ASME/ANSI B30.5 at date of manufacture.
- These capacities apply only to the crane as originally manufactured and normally equipped by Link-Belt Construction Equipment Company.





# Main Boom Working Range Diagram



- Boom geometry shown is for unloaded condition and crane standing level on firm supporting surface. Boom deflection, subsequent
  radius, and boom angle change must be accounted for when applying load to hook.
- 2. Maximum and minimum boom angles are equal to the values listed in the capacity chart for each boom length.



## **Main Boom Load Chart**

Tube Boom Lift Capacity Chart — 360° Rotation
ABCD+A [80,000+26,500 lb (36 364+12 040kg)] Counterweight — Side Frames Extended
[All capacities are listed in kips (mt)]

|                   |   |                      |                        | [All capac               | ities are liste          | d in kips (mt)       | 1                      |                        |                      |                        |
|-------------------|---|----------------------|------------------------|--------------------------|--------------------------|----------------------|------------------------|------------------------|----------------------|------------------------|
| Load              |   |                      |                        |                          | Boom Leng                | gth — ft <i>(m)</i>  |                        |                        |                      |                        |
| Radius<br>ft (m)  | 45<br>(13.8)                                  | 55<br>(16.8)         | 65<br>(19.9)           | 75<br>(22.9)             | 85<br>(26)               | 95<br>(29)           | 105<br>(32.1)          | 115<br><i>(35.1)</i>   | 125<br>(38.2)        | 135<br>(41.2)          |
| 12<br>(3.7)       | 260<br>(118.2)                                |                      |                        |                          |                          |                      |                        |                        |                      |                        |
| 13<br>(4)         | 242<br>(110)                                  |                      |                        |                          |                          |                      |                        |                        |                      |                        |
| (4.3)             | 226.1<br>(102.8)                              | 225.1<br>(102.4)     |                        |                          |                          |                      |                        |                        |                      |                        |
| 15<br>(4.6)       | 212<br>(96.4)                                 | 211.2<br>(96)        | 100                    |                          |                          |                      |                        |                        |                      |                        |
| 16<br>(4.9)       | 199.7<br>(90.8)                               | 198.9<br>(90.5)      | 198<br>(90)            |                          |                          |                      |                        |                        |                      |                        |
| 17<br>(5.2)       | 188.6<br>(85.8)                               | 187.9<br>(85.5)      | 187.1<br>(85.1)        | 470.4                    |                          |                      |                        |                        |                      |                        |
| 18<br>(5.5)<br>19 | 178.6<br>(81.2)                               | 178<br>(81)          | 177.2<br>(80.6)        | 176.4<br>(80.2)          |                          |                      |                        |                        |                      |                        |
| (5.8)<br>20       | 169.7<br>(77.2)                               | 169.1<br>(76.9)      | 168.5<br>(76.6)        | (76.3)                   | 1500                     |                      |                        |                        |                      |                        |
| (6.1)<br>25       | 161.6<br>(73.5)                               | 161<br>(73.2)<br>117 | 160.4<br>(73)<br>116.8 | 159.7<br>(72.6)<br>116.6 | 158.9<br>(72.3)<br>116.4 | 116.2                | 115.9                  | 115.7                  |                      |                        |
| (7.7)<br>30       | (53.2)<br>90.5                                | (53.2)               | (53.1)<br>90.2         | (53)<br>90               | (53)<br>89.8             | (52.9)<br>89.5       | (52.7)<br>89.2         | (52.6)                 | 88.7                 | 88.4                   |
| (9.2)<br>35       | 73.6  | (41.1)<br>73.5       | 73.4                   | (41)<br>73.2             | (40.9)<br>72.9           | (40.7)<br>72.7       | (40.6)<br>72.4         | (40.5)<br>72.1         | (40.4)<br>71.9       | (40.2)<br>71.6         |
| (10.7)<br>40      | (33.5)  | (33.5)<br>61.7       | (33.4)                 | (33.3)<br>61.3           | (33.2)                   | (33.1)               | (33)                   | (32.8)                 | (32.7)               | (32.6)                 |
| (12.2)<br>50      | 61.8<br>(28.1)                                | (28.1)<br>46.5       | 61.6<br>(28)<br>46.3   | (27.9)<br>46.1           | 61.1<br>(27.8)<br>45.9   | (27.7)<br>45.6       | (27.6)<br>45.4         | (27.5)<br>45.1         | (27.3)<br>44.8       | 59.7<br>(27.2)<br>44.5 |
| (15.3)<br>60      |   | (21.2)               | (21.1)                 | (21)                     | (20.9)                   | (20.8)               | (20.7)                 | (20.5)                 | (20.4)               | (20.3)                 |
| (18.3)<br>70      |   |                      | (16.8)                 | (16.7)                   | (16.6)                   | (16.5)               | (16.3)                 | (16.2)                 | (16.1)               | (16)                   |
| (21.4)<br>80      |   |                      |                        | 30.1<br>(13.7)           | (13.6)<br>25.3           | 29.6<br>(13.5)<br>25 | 29.3<br>(13.4)<br>24.8 | 29.3<br>(13.4)<br>24.5 | 29<br>(13.2)<br>24.2 | (13.1)                 |
| (24.4)            |   |                      |                        |                          | (11.5)                   | (11.4)<br>21.4       | (11.3)<br>21.2         | (11.2)                 | (11)                 | (11)                   |
| (27.5)<br>100     |   |                      |                        |                          |                          | (9.8)                | (9.7)<br>18.4          | (9.5)<br>18.1          | (9.5)<br>17.8        | (9.3)<br>17.6          |
| (30.5)            |   |                      |                        |                          |                          |                      | (8.4)                  | (8.3)<br>15.9          | (8.1)<br>15.6        | (8)<br>15.3            |
| (33.6)            | <u>, , , , , , , , , , , , , , , , , , , </u> |                      |                        |                          |                          |                      |                        | (7.3)                  | (7.1)<br>13.7        | (7)                    |
| (36.6)            |   |                      |                        |                          |                          |                      |                        |                        | (6.3)                | (6.1)<br>11.9          |
| (39.7)            |   |                      |                        |                          |                          |                      |                        |                        |                      | (5.5)                  |



# Tube Boom Lift Capacity Chart — 360° Rotation ABCD+A [80,000+26,500 lb (36 364+12 040kg)] Counterweight — Side Frames Extended [All capacities are listed in kips (mt)]

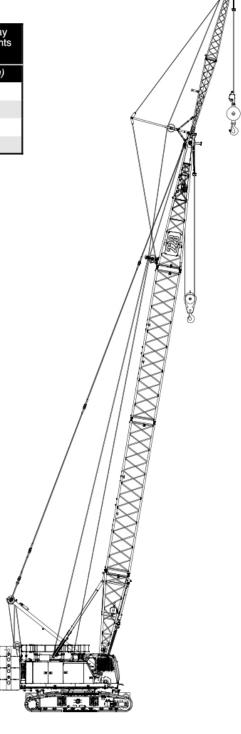
|                  |                |                     |                | [All capac     |                | d in kips ( <i>mt</i> ) | 1              |                |                |                       |
|------------------|----------------|---------------------|----------------|----------------|----------------|-------------------------|----------------|----------------|----------------|-----------------------|
| Load             |                |                     |                |                | Boom Leng      | gth — ft <i>(m)</i>     |                |                |                |                       |
| Radius<br>ft (m) | 145            | 155                 | 165            | 175            | 185            | 195                     | 205            | 215            | 225            | 235<br>(71.7)         |
| 30               | (44.3)<br>88.1 | (47.3)              | (50.4)         | (53.4)         | (56.5)         | (59.5)                  | (62.5)         | (65.6)         | (68.6)         | (71.7)                |
| (9.2)            | (40.1)         |                     |                |                |                |                         |                |                |                |                       |
| 35<br>(10.7)     | 71.3<br>(32.5) | 71<br>(32.3)        | 70.7<br>(32.2) | 67.8<br>(30.9) |                |                         |                |                |                |                       |
| 40               | 59.4           | 59.1                | 58.8           | 58.5           | 57.2           | 50.8                    | 45.4           |                |                |                       |
| (12.2)           | (27)           | (26.9)              | (26.8)         | (26.6)         | (26)           | (23.1)                  | (20.7)         |                |                |                       |
| 50<br>(15.3)     | 44.3<br>(20.2) | 44<br>(20)          | 43.7<br>(19.9) | 43.4<br>(19.8) | 43.1<br>(19.6) | 42.8<br>(19.5)          | 42.5<br>(19.4) | 40.9<br>(18.6) | 36.5<br>(16.6) | 32.8<br>(15)          |
| 60<br>(18.3)     | 34.7<br>(15.8) | 34.4<br>(15.7)      | 34.1<br>(15.5) | 33.8<br>(15.4) | 33.5<br>(15.3) | 33.2<br>(15.1)          | 32.9<br>(15)   | 32.5<br>(14.8) | 32.2<br>(14.7) | 31.9<br><i>(14.5)</i> |
| 70<br>(21.4)     | 28.4<br>(13)   | 28.2<br>(12.9)      | 27.9<br>(12.7) | 27.6<br>(12.6) | 27.3<br>(12.5) | 27<br>(12.3)            | 26.7<br>(12.2) | 26.4<br>(12)   | 26.1<br>(11.9) | 25.8<br>(11.8)        |
| 80<br>(24.4)     | 23.7<br>(10.8) | 23.4<br>(10.7)      | 23.1<br>(10.5) | 22.8<br>(10.4) | 22.5<br>(10.3) | 22.2<br>(10.1)          | 22<br>(10)     | 21.6<br>(9.9)  | 21.3<br>(9.7)  | 21<br>(9.6)           |
| 90<br>(27.5)     | 20.1<br>(9.2)  | 19.8<br><i>(</i> 9) | 19.5<br>(8.9)  | 19.2<br>(8.8)  | 18.9<br>(8.6)  | 18.6<br>(8.5)           | 18.3<br>(8.4)  | 18<br>(8.2)    | 17.7<br>(8.1)  | 17.4<br>(8)           |
| 100<br>(30.5)    | 17.3<br>(7.9)  | 17<br>(7.8)         | 16.7<br>(7.6)  | 16.4<br>(7.5)  | 16.1<br>(7.4)  | 15.8<br>(7.2)           | 15.5<br>(7.1)  | 15.2<br>(7)    | 14.9<br>(6.8)  | 14.6<br>(6.7)         |
| 110<br>(33.6)    | 15<br>(6.9)    | 14.7<br>(6.7)       | 14.4<br>(6.6)  | 14.1<br>(6.5)  | 13.8<br>(6.3)  | 13.5<br>(6.2)           | 13.2<br>(6)    | 12.9<br>(5.9)  | 12.6<br>(5.8)  | 12.3<br>(5.6)         |
| 120<br>(36.6)    | 13.2<br>(6)    | 12.9<br>(5.9)       | 12.6<br>(5.8)  | 12.3<br>(5.6)  | 12<br>(5.5)    | 11.7<br>(5.4)           | 11.4<br>(5.2)  | 11<br>(5)      | 10.7<br>(4.9)  | 10.4<br>(4.8)         |
| 130<br>(39.7)    | 11.6<br>(5.3)  | 11.3<br>(5.2)       | 11<br>(5)      | 10.7<br>(4.9)  | 10.4<br>(4.8)  | 10.1<br>(4.6)           | 9.8<br>(4.5)   | 9.5<br>(4.4)   | 9.2<br>(4.2)   | 8.8<br>(4)            |
| 140<br>(42.7)    | 10.3<br>(4.7)  | 10<br>(4.6)         | 9.7<br>(4.5)   | 9.4<br>(4.3)   | 9.1<br>(4.2)   | 8.8<br>(4)              | 8.5<br>(3.9)   | 8.1<br>(3.7)   | 7.8<br>(3.6)   | 7.5<br>(3.5)          |
| 150<br>(45.8)    |                |                     | 8.6<br>(4)     | 8.3<br>(3.8)   | 7.9<br>(3.6)   | 7.6<br>(3.5)            | 7.3<br>(3.4)   | 7<br>(3.2)     | 6.7<br>(3.1)   | 6.4<br>(3)            |
| 160<br>(48.8)    |                |                     |                | 7.3<br>(3.4)   | 7<br>(3.2)     | 6.7<br>(3.1)            | 6.3<br>(2.9)   | 6<br>(2.8)     | 5.7<br>(2.6)   | 5.4<br>(2.5)          |
| 170<br>(51.9)    |                |                     |                |                | 6.1<br>(2.8)   | 5.8<br>(2.7)            | 5.5<br>(2.5)   | 5.1<br>(2.4)   | 4.8<br>(2.2)   | 4.5<br>(2.1)          |
| 180<br>(54.9)    |                |                     |                |                |                | 5<br>(2.3)              | 4.7<br>(2.2)   | 4.4<br>(2)     | 4.1<br>(1.9)   | 3.8<br>(1.8)          |
| 190<br>(58)      |                |                     |                |                |                |                         | 4.1<br>(1.9)   | 3.7<br>(1.7)   | 3.4<br>(1.6)   | 3.1<br>(1.5)          |
| 200 (61)         |                |                     |                |                |                |                         |                | 3.1<br>(1.5)   | 2.8<br>(1.3)   | 2.5<br>(1.2)          |
| 210<br>(64.1)    |                |                     |                |                |                |                         |                |                | 2.3<br>(1.1)   | 1.9                   |
| 220<br>(67.1)    |                |                     |                |                |                |                         |                |                |                | 1.5<br>(0.7)          |



# Jib Attachment Make—up

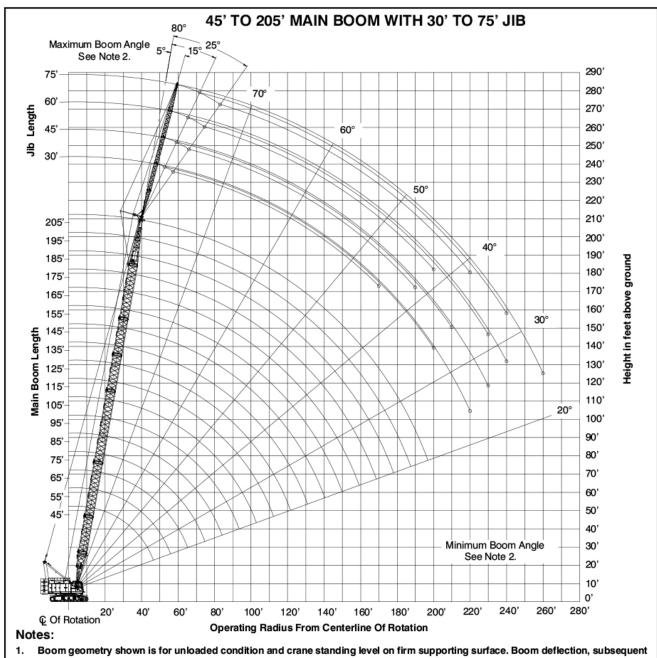
| Jib<br>Length<br>ft <i>(m)</i> | Jib Extensions | Basic Frontstay<br>Pendants<br>Required | Pairs Of Frontstay<br>Extension Pendants<br>Required |
|--------------------------------|----------------|---|--|
| 11 (111)                       | 15 ft (4.57 m) | 63 ft 5 in (19.33m)                     | 14 ft 6 in (4.42m)                                   |
| 30 (9.15)                      |                | 1                                       |  |
| 45 (13.72)                     | 1              | 1                                       | 1  |
| 60 (18.29)                     | 2              | 1                                       | 2  |
| 75 (22.86)                     | 3              | 1                                       | 3  |

- Capacities shown are in kips/metric tons (1 kip = 1,000 lb / 1 metric ton = 0.45 kips) and are not more than 75% of the tipping loads with the crane standing level on a firm supporting surface.
- 2. A deduction must be made from these capacities for the A deduction must be made from misse capacities for the weight of the main boom hook block or hook ball, jb hook block or hook ball, slings, grapples, load weighing devices, etc. When using main hook while jib is attached, reduce capacities by values shown in Crane Rating Manual. See Operator's Manual for all limitations when raising or lowering attachment.
- The capacities in the shaded areas are based on structural strength. The capacities in the non-shaded areas are based on stability ratings.
- Load ratings are based on freely suspended loads and make no allowances for such factors as the effect of the wind, ground conditions, and operating speeds. The operator shall therefore reduce load ratings in order to take these conditions into account. Refer to the Crane Rating Manual for Wind Speed Restrictions.
- 5. These capacities are for "ABC+A" counterweight.
- 6. These capacities are for 360° working areas.
- These capacities are for 30–75 ft (9.15–22.86m) jib lengths only.
- 8. The jib cannot be used on boom lengths over 205 ft (62.5m).
- 9. The least stable rated condition is over the side.
- 10. These capacities are in compliance with ASME/ANSI B30.5 at date of manufacture.
- These capacities apply only to the crane as originally manufactured and normally equipped by Link-Belt Construction Equipment Company.





# Jib Attachment Working Range Diagram



- radius, and boom angle change must be accounted for when applying load to hook.
- Maximum and minimum boom angles are equal to the values listed in the capacity chart for each boom length.



## **Jib Attachment Load Charts**

|                  |               | 5° Of         | fset          |                |                |                      |               | 15° O          | ffset         |                |                |                         |                | 25° Offset    |               |               |               |  |  |  |
|------------------|---------------|---------------|---------------|----------------|----------------|----------------------|---------------|----------------|---------------|----------------|----------------|-------------------------|----------------|---------------|---------------|---------------|---------------|--|--|--|
| Load             |               | Main Bo       | om Lenç       | th ft (m)      |                | Load                 |               | Main Bo        | om Leng       | th ft (m)      | Load           | Main Boom Length ft (m) |                |               |               |               |               |  |  |  |
| Radius<br>ft (m) | 45<br>(13.8)  | 105<br>(32.1) | 145<br>(44.3) | 185<br>(56.5)  | 205<br>(62.5)  | Radius<br>ft (m)     | 45<br>(13.8)  | 105<br>(32.1)  | 145<br>(44.3) | 185<br>(56.5)  | 205<br>(62.5)  | Radius<br>ft (m)        | 45<br>(13.8)   | 105<br>(32.1) | 145<br>(44.3) | 185<br>(56.5) | 205<br>(62.5) |  |  |  |
| 20<br>(6.1)      | 24.0<br>(11)  |               |               |                |                | 20<br>(6. 1)         |               |                |               |                |                | 20<br>(6.1)             |                |               |               |               |               |  |  |  |
| 25<br>(7.7)      | 24.0<br>(11)  |               |               |                |                | 25<br>(7. <i>7</i> ) |               |                |               |                |                | 25<br>(7. <i>T</i> )    |                |               |               |               |               |  |  |  |
| 30<br>(9.2)      | 24.0<br>(11)  |               |               |                |                | 30<br>(9.2)          | 24.0<br>(11)  |                |               |                |                | 30<br>(9.2)             | 22.1<br>(10.1) |               |               |               |               |  |  |  |
| 35<br>(10.7)     | 24.0<br>(11)  | 24.0<br>(11)  |               |                |                | 35<br>(10.7)         | 24.0<br>(11)  |                |               |                |                | 35<br>(10.7)            | 20.3<br>(9.3)  |               |               |               |               |  |  |  |
| 40<br>(12.2)     | 24.0<br>(11)  | 24.0<br>(11)  | 24.0<br>(11)  |                |                | 40<br>(12.2)         | 24.0<br>(11)  | 24.0<br>(11)   |               |                |                | 40<br>(12.2)            | 18.7<br>(8.5)  |               |               |               |               |  |  |  |
| 50<br>(15.3)     | 24.0<br>(11)  | 24.0<br>(11)  | 24.0<br>(11)  | 24.0<br>(11)   | 24.0<br>(11)   | 50<br>(15.3)         | 21.3<br>(9.7) | 24.0<br>(11)   | 24.0<br>(11)  | 24.0<br>(11)   |                | 50<br>(15.3)            | 16.3<br>(7.5)  | 20.0<br>(9.1) | 21.4<br>(9.8) |               |               |  |  |  |
| 60<br>(18.3)     | 21.8<br>(10)  | 24.0<br>(11)  | 24.0<br>(11)  | 24.0<br>(11)   | 24.0<br>(11)   | 60<br>(18.3)         | 18.0<br>(8.2) | 24.0<br>(11)   | 24.0<br>(11)  | 24.0<br>(11)   | 24.0<br>(11)   | 60<br>(18.3)            | 14.6<br>(6.7)  | 18.4<br>(8.4) | 19.9<br>(9.1) | 21.0<br>(9.6) | 21.4<br>(9.8) |  |  |  |
| 70<br>(21.4)     | 18.3<br>(8.4) | 24.0<br>(11)  | 24.0<br>(11)  | 23.1<br>(10.5) | 22.5<br>(10.3) | 70<br>(21.4)         | 15.7<br>(7.2) | 23.8<br>(10.9) | 24.0<br>(11)  | 23.6<br>(10.8) | 23.1<br>(10.5) | 70<br>(21.4)            |                | 17.0<br>(7.8) | 18.6<br>(8.5) | 19.8<br>(9)   | 20.3          |  |  |  |
| 80<br>(24.4)     |               | 21.1<br>(9.6) | 20<br>(9.1)   | 18.9<br>(8.6)  | 18.3<br>(8.4)  | 80<br>(24.4)         |               | 21.3<br>(9.7)  | 20.3<br>(9.3) | 19.3<br>(8.8)  | 18.8<br>(8.6)  | 80<br>(24.4)            |                | 15.9<br>(7.3) | 17.5<br>(8)   | 18.7<br>(8.5) | 19.2<br>(8.8) |  |  |  |
| 90<br>(27.5)     |               | 18<br>(8.2)   | 16.9<br>(7.7) | 15.7<br>(7.2)  | 15.1<br>(6.9)  | 90<br>(27.5)         |               | 18.2<br>(8.3)  | 17.1<br>(7.8) | 16.1<br>(7.4)  | 15.5<br>(7.1)  | 90<br>(27.5)            |                | 15.0<br>(6.9) | 16.6<br>(7.6) | 16.4<br>(7.5) | 15.9<br>(7.3) |  |  |  |
| 100<br>(30.5)    |               | 15.5<br>(7.1) | 14.4<br>(6.6) | 13.2<br>(6)    | 12.6<br>(5.8)  | 100<br>(30.5)        |               | 15.7<br>(7.2)  | 14.6<br>(6.7) | 13.5<br>(6.2)  | 13<br>(6)      | 100<br>(30.5)           |                | 14.3<br>(6.5) | 14.8<br>(6.8) | 13.8<br>(6.3) | 13.3<br>(6.1) |  |  |  |
| 110<br>(33.6)    |               | 13.5<br>(6.2) | 12.4<br>(5.7) | 11.2<br>(5.1)  | 10.6<br>(4.9)  | 110<br>(33.6)        |               | 13.6<br>(6.2)  | 12.6<br>(5.8) | 11.5<br>(5.3)  | 10.9<br>(5)    | 110<br>(33.6)           |                |               | 12.7<br>(5.8) | 11.7<br>(5.4) | 11.2<br>(5.1) |  |  |  |
| 120<br>(36.6)    |               | 11.9<br>(5.5) | 10.7<br>(4.9) | 9.5<br>(4.4)   | 9<br>(4.1)     | 120<br>(36.6)        |               | 12<br>(5.5)    | 10.9<br>(5)   | 9.8<br>(4.5)   | 9.2<br>(4.2)   | 120<br>(36.6)           |                |               | 11<br>(5)     | 10<br>(4.6)   | 9.5<br>(4.4)  |  |  |  |
| 130<br>(39.7)    |               |               | 9.3<br>(4.3)  | 8.2<br>(3.8)   | 7.6<br>(3.5)   | 130<br>(39.7)        |               |                | 9.5<br>(4.4)  | 8.4<br>(3.9)   | 7.8<br>(3.6)   | 130<br>(39.7)           |                |               | 9.6<br>(4.4)  | 8.5<br>(3.9)  | 8 (3.7)       |  |  |  |
| 140<br>(42.7)    |               |               | 8.2<br>(3.8)  | 7<br>(3.2)     | 6.4<br>(3)     | 140<br>(42.7)        |               |                | 8.3<br>(3.8)  | 7.2<br>(3.3)   | 6.6<br>(3)     | 140<br>(42.7)           |                |               |               | 7.3<br>(3.4)  | 6.8<br>(3.1)  |  |  |  |
| 150<br>(45.8)    |               |               | 7.2<br>(3.3)  | 6<br>(2.8)     | 5.4<br>(2.5)   | 150<br>(45.8)        |               |                | 7.3<br>(3.4)  | 6.1<br>(2.8)   | 5.6<br>(2.6)   | 150<br>(45.8)           |                |               |               | 6.3<br>(2.9)  | 5.7<br>(2.6)  |  |  |  |
| 160<br>(48.8)    |               |               | 6.3<br>(2.9)  | 5.1<br>(2.4)   | 4.5<br>(2.1)   | 160<br>(48.8)        |               |                |               | 5.2<br>(2.4)   | 4.7<br>(2.2)   | 160<br>(48.8)           |                |               |               | 5.3<br>(2.5)  | 4.8<br>(2.2)  |  |  |  |
| 170<br>(51.9)    |               |               |               | 4.3<br>(2)     | 3.7<br>(1.7)   | 170<br>(51.9)        |               |                |               | 4.5<br>(2.1)   | 3.9<br>(1.8)   | 170<br>(51.9)           |                |               |               |               | 4<br>(1.9)    |  |  |  |
| 180<br>(54.9)    |               |               |               | 3.7<br>(1.7)   | 3.1<br>(1.5)   | 180<br>(54.9)        |               |                |               | 3.8<br>(1.8)   | 3.2<br>(1.5)   | 180<br>(54.9)           |                |               |               |               |               |  |  |  |
| 190<br>(58)      |               |               |               | 3.1<br>(1.5)   |                | 190<br>(58)          |               |                |               |                |                | 190<br>(58)             |                |               |               |               |               |  |  |  |
| 200<br>(61)      |               |               |               |                |                | 200<br>(61)          |               |                |               |                |                | 200<br>(61)             |                |               |               |               |               |  |  |  |



45 ft (13.72m) Offset Jib Length - 360° Rotation - ABCD+A [80,000+26,500 lb (36 364+12 040kg)] Counterweight [All capacities are listed in kips (mt)] 5° Offset 15° Offset 25° Offset Main Boom Length ft (m) Main Boom Length ft (m) Main Boom Length ft (m) Load Load Load 200 (61.0) Radius Radius 145 (44.3) 205 (62.5) Radius 205 (62.5) 185 105 105 (13.8) (44.3)(13.8) (56.5) ft (m) (13.8)ft (m) (32.1)ft (m) (32.1)(56.5)(56.5)(32.1)(44.3)24.0 25 25 (7.7)(7.7)(11)(7.7)24.0 30 30 30 (9.2)(9.2)(9.2)(11)24.0 24.0 35 35 (10.7)(10.7)(11) (11)(9.8)(10.7)24.0 24.0 19.0 14.3 (12.2)(12.2)(12.2)(11)(8.7)(6.5)(11)50 19.6 24.0 24.0 24.0 50 15.4 20.7 23.1 50 12.0 14.4 (15.3)(10.5)(15.3)(15.3)(5.5)(6.6)(9) (11)(11)(11)(7) (9.5)60 (18.3) 23.2 (10.6) 60 15.9 24.0 24.0 24.0 24.0 13.0 17.9 20.4 22.3 60 10.4 12.9 14.0 (10.2) (18.3)(11)(8.2)(18.3)(6.4)(7.3)(11)(11)(11)(6) (9.3)(4.8)(5.9)23.4 13.4 24.0 22.9 11.2 15.8 18.2 20.1 21.0 70 (21.4) 11.8 12.9 13.7 14.0 70 (21.4) 21.7 70 (21.4) (6.1)(9.9)(11)(10.7)(10.5)(5.1)(7.2)(8.3)(9.2)(9.6)(4.2)(5.4)(5.9)(6.3)(6.4)80 (24.4) 80 11.6 18.8 20.3 19.2 18.6 10.0 14.2 16.4 18.3 19.2 80 8.4 10.8 11.9 12.8 13.1 (5.3)(8.6)(9.3)(8.5)(4.6)(6.5)(7.5)(8.4)(8.8)(24.4)(3.9)(5) (5.5)(5.9)(6) (24.4)16.6 17.1 15.4 90 12.9 15.0 16.5 90 10.0 11.1 12.0 12.4 16 16 (27.5)(7.6)(7.3)(27.5)(5.9)(6.9)(7.5)(7.3)(27.5)(5.1)(5.5)(5.7)(7.8)(7) (4.6)14.8 14.6 13.5 12.9 11.8 13.8 13.9 13.4 9.4 10.4 11.3 11.7 100 100 100 (30.5)(30.5) (30.5) (6.8)(6.7)(6.2)(5.9)(5.4)(6.3)(6.4)(6.1)(4.3)(4.8)(5.2)(5.4)13.4 12.6 10.9 10.9 12.8 11.3 8.8 10.7 11.1 110 11.5 110 11.9 110 9.9 (33.6)(6.1)(5.8)(5.3)(5) (33.6)(5) (5.9)(5.5)(5.2)(33.6)(4)(4.5)(4.9)(5.1)9.2 120 10.2 10.1 9.6 8.4 9.4 10 120 12.1 9.8 11.2 120 10.2 (36.6)(5.5)(5)(4.5)(4.2)(36.6)(4.7)(5.1)(4.6)(4.4)(36.6)(3.9)(4.3)(4.7)(4.6)130 (39.7) 10.7 9.6 8.4 7.8 9.6 9.8 8.7 8.2 8.9 8.5 130 130 (3.9)(39.7)(4.4)(3.8)(39.7)(4.1)(4.1)(3.9)(4.9)(4.4)(3.6)(4.5)(4)140 9.6 8.4 7.2 6.6 140 8.6 7.5 6.9 140 8.6 7.7 7.2 (42.7)(3.3)(42.7)(3.2)(42.7)(3.3)(4.4)(3.9)(3.5)(3.5)(3)(4)(4) 7.6 62 150 74 5.6 150 6.4 5.9 150 7.7 6.7 61 (45.8) (45.8) (45.8)(3.4)(2.9)(2.6)(3.5)(3) (2.7)(3.5)(3.1)(2.8)6.5 5.3 4.7 6.6 5.5 5.7 5.2 (48.8)(3) (2.5)(2.2)(48.8)(2.5)(2.3)(48.8)(2.6)(2.4)5.8 4.6 4.7 4.2 170 (51.9) 4.9 4.4 170 170 (51.9)(1.9)(51.9)(2.7)(2.1)(2.2)(2)(2.3)(2)3.9 3.3 180 (54.9) 5.1 4 3.5 3.6 180 180 (54.9)(1.9)(54.9)(2.4)(1.8)(1.5)(1.6)(1.7)3.3 3.4 3 (58) (58)(1.5)(1.6)(58)(1.4)200 200 200 (61)(61)(61)



|                | (10.2              |                |                     | - Long        | 00            | 0° Rotat<br>[All (   | capaciti      | es are I      | isted in      | kips (n       | nt)]          | 00 00            |              |  |               | ter weig     | ,,,,,         |
|----------------|--------------------|----------------|---------------------|---------------|---------------|----------------------|---------------|---------------|---------------|---------------|---------------|------------------|--------------|--|---------------|--------------|---------------|
|                |                    | 5° Of          |                     |               |               |                      |               | 15° O         |               |               |               |                  |              | 25° O                                  |               |              |               |
| Load<br>Radius | 15                 |                | om Leng             | _ ` _         | 005           | Load                 |               |               |               |               |               |                  |              | Main Boom Length ft (m) 45 105 145 185 |               |              |               |
| ft (m)         | 45<br>(13.8)       | 105<br>(32.1)  | 145<br>(44.3)       | 185<br>(56.5) | 205<br>(62.5) | ft (m)               | 45<br>(13.8)  | 105<br>(32.1) | 145<br>(44.3) | 185<br>(56.5) | 200<br>(61.0) | Radius<br>ft (m) | (13.8)       | (32.1)                                 | 145<br>(44.3) | (56.5)       | 205<br>(62.5) |
| 30<br>(9.2)    | 23.9<br>(10.9)     |                |                     |               |               | 30<br>(9. <i>2</i> ) |               |               |               |               |               | 30<br>(9.2)      |              |  |               |              |               |
| 35<br>(10.7)   | 22.8<br>(10.4)     |                |                     |               |               | 35<br>(10.7)         |               |               |               |               |               | 35<br>(10.7)     |              |  |               |              |               |
| 40<br>(12.2)   | 20.4<br>(9.3)      | 23.3<br>(10.6) |                     |               |               | 40<br>(12.2)         | 15.2<br>(7)   |               |               |               |               | 40<br>(12.2)     |              |  |               |              |               |
| 50<br>(15.3)   | 15.8<br>(7.2)      | 22.1<br>(10.1) | 22.2<br>(10.1)      |               |               | 50<br>(15.3)         | 12.3<br>(5.6) | 15.4<br>(7)   |               |               |               | 50<br>(15.3)     | 9.5<br>(4.4) |  |               |              |               |
| 60<br>(18.3)   | 12.8<br>(5.9)      | 19.2<br>(8.8)  | 21.3<br>(9.7)       | 20.9<br>(9.5) | 20.3<br>(9.3) | 60<br>(18.3)         | 10.3<br>(4.7) | 13.4<br>(6.1) | 14.9<br>(6.8) |               |               | 60<br>(18.3)     | 8.2<br>(3.8) | 9.6<br>(4.4)                           |               |              |               |
| 70<br>(21.4)   | 10.8<br><i>(5)</i> | 16.4<br>(7.5)  | 19.8<br><i>(</i> 9) | 20.2<br>(9.2) | 19.7<br>(9)   | 70<br>(21.4)         | 8.9<br>(4.1)  | 11.9<br>(5.5) | 13.3<br>(6.1) | 14.5<br>(6.6) | 15.0<br>(6.9) | 70<br>(21.4)     | 7.2<br>(3.3) | 8.7<br>(4)                             | 9.3<br>(4.3)  |              |               |
| 80<br>(24.4)   | 9.3<br>(4.3)       | 14.2<br>(6.5)  | 17.2<br>(7.9)       | 19.4<br>(8.9) | 18.9<br>(8.6) | 80<br>(24.4)         | 7.8<br>(3.6)  | 10.6<br>(4.9) | 12.0<br>(5.5) | 13.2<br>(6)   | 13.7<br>(6.3) | 80<br>(24.4)     | 6.4<br>(3)   | 7.9<br>(3.6)                           | 8.6<br>(4)    | 9.1<br>(4.2) | 9.3<br>(4.3)  |
| 90<br>(27.5)   | 8.2<br>(3.8)       | 12.5<br>(5.7)  | 15.3<br>(7)         | 16.2<br>(7.4) | 15.7<br>(7.2) | 90<br>(27.5)         | 7.0<br>(3.2)  | 9.6<br>(4.4)  | 11.0<br>(5)   | 12.1<br>(5.5) | 12.6<br>(5.8) | 90<br>(27.5)     | 5.8<br>(2.7) | 7.3<br>(3.4)                           | 8.0<br>(3.7)  | 8.5<br>(3.9) | 8.8<br>(4)    |
| 100<br>(30.5)  | 7.3<br>(3.4)       | 11.2<br>(5.1)  | 13.7<br>(6.3)       | 13.7<br>(6.3) | 13.1<br>(6)   | 100<br>(30.5)        |               | 8.8<br>(4)    | 10.1<br>(4.6) | 11.2<br>(5.1) | 11.7<br>(5.4) | 100<br>(30.5)    |              | 6.8<br>(3.1)                           | 7.5<br>(3.5)  | 8.0<br>(3.7) | 8.3<br>(3.8)  |
| 110<br>(33.6)  |                    | 10.1<br>(4.6)  | 12.4<br>(5.7)       | 11.7<br>(5.4) | 11.1<br>(5.1) | 110<br>(33.6)        |               | 8.1<br>(3.7)  | 9.3<br>(4.3)  | 10.4<br>(4.8) | 10.9<br>(5)   | 110<br>(33.6)    |              | 6.4<br>(3)                             | 7.1<br>(3.3)  | 7.6<br>(3.5) | 7.8<br>(3.6)  |
| 120<br>(36.6)  |                    | 9.2<br>(4.2)   | 11.1<br>(5.1)       | 10<br>(4.6)   | 9.4<br>(4.3)  | 120<br>(36.6)        |               | 7.5<br>(3.5)  | 8.7<br>(4)    | 9.7<br>(4.5)  | 9.9<br>(4.5)  | 120<br>(36.6)    |              | 6.0<br>(2.8)                           | 6.7<br>(3.1)  | 7.2<br>(3.3) | 7.4<br>(3.4)  |
| 130<br>(39.7)  |                    | 8.5<br>(3.9)   | 9.7<br>(4.5)        | 8.6<br>(4)    | 8<br>(3.7)    | 130<br>(39.7)        |               | 7.0<br>(3.2)  | 8.1<br>(3.7)  | 9 (4.1)       | 8.5<br>(3.9)  | 130<br>(39.7)    |              | 5.7<br>(2.6)                           | 6.3<br>(2.9)  | 6.9<br>(3.2) | 7.1<br>(3.3)  |
| 140<br>(42.7)  |                    | 7.9<br>(3.6)   | 8.6<br>(4)          | 7.4<br>(3.4)  | 6.8<br>(3.1)  | 140<br>(42.7)        |               | 6.6<br>(3)    | 7.7<br>(3.5)  | 7.8<br>(3.6)  | 7.2<br>(3.3)  | 140<br>(42.7)    |              |  | 6.0<br>(2.8)  | 6.5<br>(3)   | 6.8<br>(3.1)  |
| 150<br>(45.8)  |                    | 7.3<br>(3.4)   | 7.6<br>(3.5)        | 6.4<br>(3)    | 5.8<br>(2.7)  | 150<br>(45.8)        |               |               | 7.2<br>(3.3)  | 6.7<br>(3.1)  | 6.2<br>(2.9)  | 150<br>(45.8)    |              |  | 5.8<br>(2.7)  | 6.3<br>(2.9) | 6.5<br>(3)    |
| 160<br>(48.8)  |                    |                | 6.7<br>(3.1)        | 5.5<br>(2.5)  | 4.9<br>(2.3)  | 160<br>(48.8)        |               |               | 6.9<br>(3.2)  | 5.8<br>(2.7)  | 5.3<br>(2.5)  | 160<br>(48.8)    |              |  | 5.6<br>(2.6)  | 6.0<br>(2.8) | 5.6<br>(2.6)  |
| 170<br>(51.9)  |                    |                | 5.9<br>(2.7)        | 4.7<br>(2.2)  | 4.1<br>(1.9)  | 170<br>(51.9)        |               |               | 6.1<br>(2.8)  | 5<br>(2.3)    | 4.4<br>(2)    | 170<br>(51.9)    |              |  |               | 5.2<br>(2.4) | 4.7<br>(2.2)  |
| 180<br>(54.9)  |                    |                | 5.2<br>(2.4)        | 4 (1.9)       | 3.4<br>(1.6)  | 180<br>(54.9)        |               |               | 5.4<br>(2.5)  | 4.3<br>(2)    | 3.7<br>(1.7)  | 180<br>(54.9)    |              |  |               | 4.5<br>(2.1) | 4<br>(1.9)    |
| 190<br>(58)    |                    |                | 4.6<br>(2.1)        | 3.4<br>(1.6)  |               | 190<br>(58)          |               |               |               | 3.6<br>(1.7)  | 3.1<br>(1.5)  | 190<br>(58)      |              |  |               | 3.8<br>(1.8) | 3.3<br>(1.5)  |
| 200<br>(61)    |                    |                |                     |               |               | 200<br>(61)          |               |               |               | 3.1<br>(1.5)  |               | 200<br>(61)      |              |  |               |              |               |



| 75 f                   | t (22.86           | 6 <i>m</i> ) Of | fset Jik      | Lengt         | h — 36        | 0° Rotat<br>[All       | ion — /       | ABCD -<br>es are l | ⊦A [80,<br>isted in | 000+2<br>kips ( <i>n</i> | 6,500 l       | b (36 36         | 4+12 (       | )40kg)        | ] Coun        | terweig       | ght           |
|------------------------|--------------------|-----------------|---------------|---------------|---------------|------------------------|---------------|--------------------|---------------------|--------------------------|---------------|------------------|--------------|---------------|---------------|---------------|---------------|
|                        |                    | 5° Of           |               |               |               |                        |               | 15° O              | ffset               |                          |               |                  |              | 25° C         | )ffset        |               |               |
| Load                   |                    | Main Bo         | om Lenç       | gth ft (m)    |               | Load                   |               | Main Bo            | om Leng             | th ft (m)                |               | Load             |              | Main B        | oom Lenç      | gth ft (m)    |               |
| Radius<br>ft (m)       | 45<br>(13.8)       | 105<br>(32.1)   | 145<br>(44.3) | 185<br>(56.5) | 205<br>(62.5) | Radius<br>ft (m)       | 45<br>(13.8)  | 105<br>(32.1)      | 145<br>(44.3)       | 185<br>(56.5)            | 200<br>(61.0) | Radius<br>ft (m) | 45<br>(13.8) | 105<br>(32.1) | 145<br>(44.3) | 185<br>(56.5) | 205<br>(62.5) |
| 35<br>(10.7)           | 18.8<br>(8.6)      |                 |               |               |               | 35<br>(10.7)           |               |                    |                     |                          |               | 35<br>(10.7)     |              |               |               |               |               |
| 40<br>(12.2)           | 17.1<br>(7.8)      |                 |               |               |               | 40<br>(12.2)           |               |                    |                     |                          |               | 40<br>(12.2)     |              |               |               |               |               |
| 50<br>(15.3)           | 13.3<br>(6.1)      | 17.9<br>(8.2)   | 18.0<br>(8.2) |               |               | 50<br>(15.3)           | 10.3<br>(4.7) |                    |                     |                          |               | 50<br>(15.3)     |              |               |               |               |               |
| 60<br>(18.3)           | 10.9<br><i>(5)</i> | 15.4<br>(7)     | 17.2<br>(7.9) | 17.0<br>(7.8) | 16.6<br>(7.6) | 60<br>(18.3)           | 8.6<br>(4)    | 10.7<br>(4.9)      |                     |                          |               | 60<br>(18.3)     | 6.7<br>(3.1) |               |               |               |               |
| 70<br>(21.4)           | 9.1<br>(4.2)       | 13.1<br>(6)     | 15.5<br>(7.1) | 16.4<br>(7.5) | 16.1<br>(7.4) | 70<br>(21.4)           | 7.4<br>(3.4)  | 9.4<br>(4.3)       | 10.4<br>(4.8)       | 11.2<br>(5.1)            |               | 70<br>(21.4)     | 5.8<br>(2.7) | 6.8<br>(3.1)  |               |               |               |
| 80<br>(24.4)           | 7.8<br>(3.6)       | 11.4<br>(5.2)   | 13.5<br>(6.2) | 15.5<br>(7.1) | 15.6<br>(7.1) | 80<br>(24.4)           | 6.4<br>(3)    | 8.4<br>(3.9)       | 9.4<br>(4.3)        | 10.1<br>(4.6)            | 10.5<br>(4.8) | 80<br>(24.4)     | 5.2<br>(2.4) | 6.2<br>(2.9)  | 6.6<br>(3)    |               |               |
| 90<br>(27.5)           | 6.8<br>(3.1)       | 10.0<br>(4.6)   | 12.0<br>(5.5) | 13.8<br>(6.3) | 14.7<br>(6.7) | 90<br>(27.5)           | 5.7<br>(2.6)  | 7.6<br>(3.5)       | 8.5<br>(3.9)        | 9.3<br>(4.3)             | 9.6<br>(4.4)  | 90<br>(27.5)     | 4.6<br>(2.1) | 5.6<br>(2.6)  | 6.1<br>(2.8)  | 6.4<br>(3)    | 6.6<br>(3)    |
| 100<br>(30.5)          | 6.0<br>(2.8)       | 9.0<br>(4.1)    | 10.8<br>(5)   | 12.5<br>(5.7) | 13.3<br>(6.1) | 100<br>(30.5)          | 5.1<br>(2.4)  | 6.9<br>(3.2)       | 7.8<br>(3.6)        | 8.6<br>(4)               | 8.9<br>(4.1)  | 100<br>(30.5)    | 4.2<br>(2)   | 5.2<br>(2.4)  | 5.7<br>(2.6)  | 6.0<br>(2.8)  | 6.2<br>(2.9)  |
| 110<br>(33.6)          | 5.4<br>(2.5)       | 8.1<br>(3.7)    | 9.7<br>(4.5)  | 11.3<br>(5.2) | 11.3<br>(5.2) | 110<br>(33.6)          | 4.7<br>(2.2)  | 6.3<br>(2.9)       | 7.2<br>(3.3)        | 8.0<br>(3.7)             | 8.3<br>(3.8)  | 110<br>(33.6)    |              | 4.8<br>(2.2)  | 5.3<br>(2.5)  | 5.7<br>(2.6)  | 5.8<br>(2.7)  |
| 120<br>(36.6)          |                    | 7.3<br>(3.4)    | 8.9<br>(4.1)  | 10.1<br>(4.6) | 9.6<br>(4.4)  | 120<br>(36.6)          |               | 5.8<br>(2.7)       | 6.7<br>(3.1)        | 7.4<br>(3.4)             | 7.7<br>(3.5)  | 120<br>(36.6)    |              | 4.5<br>(2.1)  | 5.0<br>(2.3)  | 5.3<br>(2.5)  | 5.5<br>(2.5)  |
| 130<br>(39. <i>7</i> ) |                    | 6.7<br>(3.1)    | 8.1<br>(3.7)  | 8.7<br>(4)    | 8.2<br>(3.8)  | 130<br>(39. <i>7</i> ) |               | 5.4<br>(2.5)       | 6.2<br>(2.9)        | 6.9<br>(3.2)             | 7.3<br>(3.4)  | 130<br>(39.7)    |              | 4.3<br>(2)    | 4.7<br>(2.2)  | 5.1<br>(2.4)  | 5.2<br>(2.4)  |
| 140<br>(42.7)          |                    | 6.2<br>(2.9)    | 7.5<br>(3.5)  | 7.6<br>(3.5)  | 7<br>(3.2)    | 140<br>(42.7)          |               | 5.1<br>(2.4)       | 5.8<br>(2.7)        | 6.5<br>(3)               | 6.8<br>(3.1)  | 140<br>(42.7)    |              | 4.0<br>(1.9)  | 4.5<br>(2.1)  | 4.8<br>(2.2)  | 5.0<br>(2.3)  |
| 150<br>(45.8)          |                    | 5.7<br>(2.6)    | 7.0<br>(3.2)  | 6.5<br>(3)    | 6<br>(2.8)    | 150<br>(45.8)          |               | 4.8<br>(2.2)       | 5.5<br>(2.5)        | 6.1<br>(2.8)             | 6.4<br>(3)    | 150<br>(45.8)    |              | 3.9<br>(1.8)  | 4.2<br>(2)    | 4.6<br>(2.1)  | 4.7<br>(2.2)  |
| 160<br>(48.8)          |                    | 5.4<br>(2.5)    | 6.5<br>(3)    | 5.6<br>(2.6)  | 5.1<br>(2.4)  | 160<br>(48.8)          |               | 4.5<br>(2.1)       | 5.2<br>(2.4)        | 5.8<br>(2.7)             | 5.5<br>(2.5)  | 160<br>(48.8)    |              |               | 4.1<br>(1.9)  | 4.4<br>(2)    | 4.5<br>(2.1)  |
| 170<br>(51.9)          |                    | 5.1<br>(2.4)    | 6<br>(2.8)    | 4.9<br>(2.3)  | 4.3<br>(2)    | 170<br>(51.9)          |               |                    | 4.9<br>(2.3)        | 5.2<br>(2.4)             | 4.7<br>(2.2)  | 170<br>(51.9)    |              |               | 3.9<br>(1.8)  | 4.2<br>(2)    | 4.3<br>(2)    |
| 180<br>(54.9)          |                    |                 | 5.3<br>(2.5)  | 4.2<br>(2)    | 3.6<br>(1.7)  | 180<br>(54.9)          |               |                    | 4.7<br>(2.2)        | 4.5<br>(2.1)             | 3.9<br>(1.8)  | 180<br>(54.9)    |              |               |               | 4.1<br>(1.9)  | 4.2<br>(2)    |
| 190<br>(58)            |                    |                 | 4.7<br>(2.2)  | 3.6<br>(1.7)  | 3<br>(1.4)    | 190<br>(58)            |               |                    | 4.5<br>(2.1)        | 3.8<br>(1.8)             | 3.3<br>(1.5)  | 190<br>(58)      |              |               |               | 3.9<br>(1.8)  | 3.6<br>(1.7)  |
| 200<br>(61)            |                    |                 | 4.2<br>(2)    | 3<br>(1.4)    |               | 200<br>(61)            |               |                    |                     | 3.3<br>(1.5)             |               | 200<br>(61)      |              |               |               | 3.5<br>(1.6)  | 3<br>(1.4)    |



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